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The Heating and Ventilating of School Houses—I.

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This type of building is one which has probably been discussed in the heating journals more frequently than any other, but at the same time, the rapid development in schoolhouse architecture and the higher standards of ventilation called for, would seem to warrant further publication of articles along this line, even though the subject is a familiar one to the readers of "Domestic Engineering." Nothing especially new is claimed by the writer in what is to follow, but it is hoped to present in concise and practical form a considerable amount of data which has been tested in actual service and found to give satisfactory results. With the help of these tables and formulae, and the directions for their use which accompany them, the average contractor and up-to-date fitter should be able to lay out and install a heating and ventilating system for almost any building of this class.

While it is intended to take up in some detail the various systems employed in schoolhouse work independently, there are certain phases of the problem, and certain pieces of apparatus, which are more or less common to all. For the sake of brevity these matters of common interest will be taken up separately, and afterwards their practical application to the different systems of heating will be clearly shown.

General Considerations.

Among these may be included—air supply for ventilation, heat for ventilation, air as a carrier of heat, measurement of air flow, heat loss from buildings, methods of offsetting heat loss, and fuel requirements for heating and ventilation.

General Equipment.

This includes furnaces, boilers, radiators of various kinds, pumps and traps, fans, filters, engines and motors, ducts and flues, dampers and automatic temperature regulation.

Physics of Heating and Ventilation.

Before considering any of the above, let us define briefly some of the terms which occur frequently in heating and ventilating work, and with which every engineer and fitter should be familiar. The more important of these are as follows: Heat, or thermal unit (T. u.); latent heat conduction; radiation; temperature; combustion; evaporation; saturated steam; superheated steam; dry steam; wet steam; absolute pressure; gauge pressure; vacuum.

While no doubt the older readers of this journal are familiar with all of these matters, it is well for the younger men to fix these definitions firmly in mind, as they are constantly coming up in one form or another in the various problems which go to make up the general subjects of heating and ventilation.

Heat Unit.—This is the unit of heat measurement, and is the quantity required to raise the temperature of one pound of water one degree. For example: It requires $10 \times 50 = 500$ T. u. to raise the temperature of 10 pounds of water 50 degrees.

Latent Heat.—This is the heat which disappears when ice is melted into water, or water evaporated into steam. For example—966 heat units are required to change one pound of water at a temperature of 212 degrees into steam at the same temperature. When the steam is condensed, this same amount of heat will be given out again. This peculiarity makes water an especially good agent for the transmission of heat through long distances, for it can be changed into steam in the boiler, absorbing a large amount of latent heat, which is again given out when it is condensed in the radiator. The latent heat of steam at different pressures and temperatures is given in a "steam table," which may be found in any engineer's hand book on steam engineering and in many catalogues.

Conduction.—This refers to the transfer of heat between two bodies which are in contact, or between different parts of the same body which are at different temperatures. The transmission of heat from a warm room through the walls of a building to the outer air is a practical illustration of conduction.

Radiation.—The transmission of heat through the air from an open fire or radiator, which warms the walls of the room without raising the temperature of the air, is called radiation. Part of the heat absorbed by the walls in this manner is given up to the air in contact with them by conduction.

Temperature.—This indicates the intensity or degree of heat, and not the quantity. It is commonly expressed in degrees Fahrenheit (F). The rise of the mercury column in a thermometer between the freezing point of water and the boiling point, at atmospheric pressure, is divided into 180 parts called degrees, and the zero of this scale is taken as 32 degrees below the freezing point, which makes the boiling point $32 + 180 = 212$ degrees.

Combustion.—This is the chemical union of the oxygen in the air with the carbon of the fuel, and the combination of these two elements produces the heat, which, in various ways, is utilized for power and heating purposes in the form of steam.

There are other chemical combinations in the process of combustion, but the above is by far the most important.

A pound of average coal of good quality gives out approximately 13,000 heat units when burned and requires

the oxygen contained in about 12 pounds of air for complete combustion. In practice about 18 pounds of air are required per pound of coal with forced draft and 24 pounds with natural draft, and only about 60 per cent or 7,800 heat units are absorbed by the water in the boiler. The remaining heat is lost, partly by radiation from the furnace and partly by passing up the chimney with the waste gases. The term "rate of combustion," as commonly used, means the pounds of coal burned per hour per square foot of grate surface in the furnace.

Evaporation.—This is the name given to the process of changing water into steam by the absorption of heat. The amount of heat required to change a pound of water into steam is called the latent heat of evaporation, as already described, and varies with the pressure in the boiler. The term "rate of evaporation," as commonly used, means the pounds of water evaporated into steam per pound of coal.

Saturated and Superheated Steam.—Steam may be either saturated or superheated; the former being that which is in the presence of, and at the same temperature as, the water from which it was evaporated.

There is always a definite relation between the temperature and pressure in the case of saturated steam.

Superheated steam is that which has been heated to a temperature above that due to its pressure. In power work steam is superheated by passing it through pipes exposed to the furnace gases after it has left the boiler. Superheated steam is not employed in heating work except as it is formed by the action of pressure reducing valves and in certain phases of exhaust steam heating.

Wet and Dry Steam.—Wet steam is that containing a certain amount of moisture in the form of a fine spray or mist, and which has no heating value. Dry steam, as its name implies, does not contain unevaporated moisture. The percentage of dry steam, in a given sample, is called its quality, and the carrying over of moisture with the steam from a boiler into the main is called priming.

Absolute and Gauge Pressure.

The pressure within a steam boiler is commonly expressed in pounds per square inch. The pressure indicated by the ordinary steam gauge is known as **gauge pressure,** and shows the pressure within the boiler **above** that of the atmosphere; that is the absolute pressure is equal to the gauge pressure plus 15, the latter being approximately the atmospheric pressure. Gauge pressure is commonly used in all heating problems except where the so-called vacuum system is used.

Vacuum.—The term vacuum as employed in heating work simply means any pressure below that of the atmosphere. It is commonly expressed in inches of mercury by means of a vacuum gauge. The following table gives the pressure below atmosphere corresponding to the reading of a vacuum gauge:

Table I.

Reading of Vacuum Gauge in Inches of Mercury.	Pressure in Pounds Per Square Inch Below Atmosphere.
2	.98
4	1.96
6	2.94
8	3.92
10	4.90
12	5.88
14	6.86

Having explained briefly the topics enumerated under "Physics of Heating and Ventilation" let us now take up the matters included in "General Considerations in a similar manner."

Air Supply for Ventilation.

While the real harm of a vitiated atmosphere is not caused by carbonic acid gas unless present in large quantities it is known that the harmful impurities given off by the process of respiration exist in a fixed amount proportional to the carbonic acid; hence as the relative proportion of this gas present is easily determined by simple tests it is used as an indicator of the actual condition of the air with regard to its purity. When carbonic acid is present in excess of 10 parts in 10,000 a feeling of weariness, usually accompanied by a headache, will be felt, while even with 8 parts in 10,000 the room will appear close. For general considerations of ventilation the limit should be placed at 6 to 7 parts in 10,000, thus allowing an increase of 2 to 3 parts over that present in outdoor air, which under average conditions may be considered to contain 4 parts in 10,000. It should be stated here, however, that too high a temperature in a schoolroom will produce much the same effect as an excess of carbonic acid, even when the air is comparatively pure, also, too high a humidity, with a normal temperature, will give practically the same results. Again, the smell of clothing upon children, even from the better parts of a city, is often mistaken for poor ventilation.

From this it is evident that any complaint of poor air from a class room should be followed up by a measurement of the supply, and if this is found to be ample, the temperature should be looked into and also the matter of "schoolroom odors." Failing to find any difficulty here, and especially if the plant contains a humidifier, see that "dog day weather" is not being pumped into the rooms. It is often thought that the more of a good thing, the better, but this does not apply to heat and humidity.

The amount of air required to give any standard of purity can be computed if the amount of carbonic acid gas given off by the act of respiration is known. This, for an adult at rest, has been found to be about 0.6 of a cubic foot per hour. If we assume the external air to contain 4 parts of this gas in 10,000 and are to allow 6 parts in an occupied room, it will make an increase of 2 parts in 10,000, or in other words, there will be $\frac{2}{10,000} = 0.0002$ cubic feet of carbonic acid gas mixed with each cubic foot of fresh air entering the room. From this it is evident that if one person gives off 0.6 cubic feet of carbonic acid gas per hour it will require $0.6 \div .000\ 2 = 3,000$ cubic feet of air per hour per person to keep the air in the room at the standard of 6 parts of carbonic acid to 10,000 parts of air. Table II, computed on this basis, will be found convenient for determining the volume of air per person for maintaining different standards of purity.

Table II.

Parts of Carbonic Acid Gas in 10,000 Parts of Air.	Cubic Feet of Air Required Per Hour Per Person.
5	6,000
6	3,000
7	2,000
8	1,500
9	1,200
10	1,000

The volume of air required in school house ventilation has been fixed partly by practice and partly by law.

Massachusetts requires 1,800 cubic feet per pupil per hour, while in the case of high schools the best engineers usually design their plants for a maximum of 3,000 cubic feet per hour per pupil for class rooms and laboratories. School assembly halls require less, as they are high studded in comparison with the floor area, and the time of occupation is comparatively short, except upon special occasions. A normal air supply of 1,200 cubic feet per hour per occupant will usually be found sufficient for rooms of this type, if the flues and registers are made

large enough so that a greater volume of air may be supplied, if required, without calling for too high velocities.

The ventilation of coat rooms and toilets should be by the exhaust method only, and should amount to a complete change of air contents every 8 to 10 minutes. The supply of air for these rooms should be drawn from the corridors by placing louvres in the lower panels of the doors, or by shortening them so as to leave an opening beneath the door at the floor. Sometimes special openings are made in the wall to give the required area, if the room has only one door.

Basement playrooms are usually provided with fresh air from the supply ducts, amounting to a complete change about every 10 minutes. This air, or a considerable portion of it, eventually finds its way out through the basement toilet rooms. For convenient reference, we may provide for the following air supply, under average conditions, for the different types of school buildings:

Table III.

Type of Building or Room.	Air Supply Per Person.
Classroom in primary school	1,800 cu. ft. per hr.
Classroom in grammar school	2,400 cu. ft. per hr.
Classroom in high school	3,000 cu. ft. per hr.
Assembly hall	1,200 cu. ft. per hr.
Corridor, with wardrobes	Same as classroom, per cu. ft. of space.
Corridor, without wardrobes	One-half the above.
Basement playrooms	Complete change every 10 min.
Toilet and coat rooms	Complete change every 8 to 10 min.

Mention has been made of the importance of measuring the air supply to the different rooms, in order to determine if apparent deficiencies in ventilation are actually due to insufficient air supply. This is done by means of an anemometer, which registers the distance in feet of the air passing through it when held in front of a register face. Minute readings are usually sufficiently long for this purpose, and the reading of the anemometer (starting with the pointer at zero) multiplied by the area of the register opening in square feet, will give the air supply in cubic feet per minute.

The velocity of air flow through a register varies in different parts, usually being higher at the top than at the bottom, hence, to get an average reading the anemometer should be moved slowly back and forth in either vertical or horizontal lines, holding the instrument 3 or 4 inches from the register face. Ordinarily the average velocity may be obtained at a single point at the center of the opening, but if the register is at the top of the flue it is generally better to move the anemometer over the entire surface.

By taking the measurement about 4 inches from the face of the register the separate jets of air issuing through the fretwork have an opportunity to become united in a solid stream, having a sectional area equal to the over-all area of the register. As the inlet registers of all the standard classrooms in a building are commonly made the same size, the engineer may compute the velocity necessary to give the required air supply, thus making the air measurement by the taking of a single reading. For example: A standard classroom in a high school building should receive 50x50=2,500 cubic feet of air per minute, and if the over-all area of the inlet register is 6 square feet, the average velocity of air flow through it should not fall below 2,500÷6=416 feet per minute.

Heat Required for Ventilation.

The heat required for ventilation varies with the season of the year, and is that required for raising the total air supply from the outside temperature to 70 degrees, the normal inside temperature. This for any given condition is found as follows: It has been determined by experiment that 1 T. u. will raise the temperature of 1 cubic foot of air 55 degrees, or will raise 55 cubic feet 1 degree. From this it is evident that the heat units required to raise the temperature of any quantity of air through any number of degrees will be equal to the volume in cubic feet multiplied by the rise in temperature in degrees, divided by 55.

Expressed as an equation this becomes

$$(1)\quad \text{T. V.} = \frac{V \times T}{55}, \text{ in which}$$

V=volume of air, in cubic feet, to be heated.
T=rise in temperature, in degrees.

The factor $\frac{T}{55}$ is approximately 1.1 for 60 degrees, 1.3 for 70 degrees, and 1.5 for 80 degrees. Hence, if the air is to be raised from zero to 70 degrees, the volume in cubic feet per hour, multiplied by 1.3 will give the heat units required for ventilation during the same length of time. In like manner, the heat required for any other rise in temperature is easily found.

Example (1). A grammar school building has the equivalent of 10 standard classrooms to be ventilated, each containing 50 pupils. How many heat units will be required per hour for ventilating purposes alone when it is 10 degrees below zero outside?

Total air supply per hour, 2,400×50×10=1,200,000 cubic feet. The factor for 80 degrees rise is 1.5. Hence the total heat required per hour is 1,200,000×1.5=1,800,000T. u.

The heat required for ventilating purposes is entirely independent of that used in warming the building, although the two quantities are sometimes mixed and introduced together in certain systems of heating, as noted below.

Air as a Carrier of Heat.

When the heat for warming a room is supplied independently of the ventilation, as when direct radiation is used, the air is only raised to a final temperature of 70 degrees as previously described. In some arrangements the air is made use of for carrying in the heat necessary for warming the room, as well as for ventilation, in which case it must be raised to a temperature higher than 70 degrees. The final temperature may be found in any given case if the air supply and the heat requirements are known. This is done by use of formula (1) transposed to the form of (2) $T = \frac{\text{T. V.} \times 55}{V}$, in which the symbols represent the same quantities as before. Under these conditions the volume of air entering the room is known and the number of heat units it must absorb, and the question becomes, what will be the rise in temperature? This added to 70 will give the final temperature of the air for both heating and ventilating.

Example (2). The air supply to a class room is 150,000 cubic feet per hour, and the heat loss by transmission and leakage is 30,000 T. u. during the same period of time. What must be the temperature of the air delivered to the room? In this case

T. u. = 30,000.
V = 150,000

which substituted in formula (2) gives $T = \frac{30{,}000 \times 55}{150{,}000} = 11$ degrees. From which the final temperature is found to be 70+11=81 degrees.

The methods of transmitting the heat to a room in practical work will be taken up later under the head of design.

(To be continued.)

Sectional Steam Heating in Chicago's Business Center

Paper by S. Morgan Bushnell, Read at the Fourth Annual Meeting of the National District Heating Association in Detroit, Mich., June 25-27, 1912

With the growth of the central station lighting and power business in Chicago, and the consequent development of great power stations, there came about a gradual increase in the size of the building served by the lighting company. As these larger buildings, one by one, began to use central station service for light and power, there arose a demand for a company which would complete the cycle by providing for the heating of buildings, thus enabling owners to buy the three forms of energy required in the operation of a building, namely, heat, light, and mechanical power. To supply this need a company was organized in Chicago in 1900, called the Illinois Maintenance Company.

This company has operated on a scheme somewhat diverse from that followed by the majority of steam heating companies. It has installed no plants of its own and, with one or two exceptions, has installed no boilers. It simply contracts to operate boiler plants already installed in buildings, so as to furnish steam for heating and other purposes. This scheme at first sight might seem like a radical departure from the ideas thus far entertained by the steam heating companies. It might be thought that the central station idea was being lost sight of and that a policy of decentralization, rather than centralization, was being adopted. To a certain extent this is true, but it must be borne in mind that the conditions to be met in the central parts of larger cities are radically different from those in smaller towns.

The heating company in the smaller town which conducts a house to house business has much in its favor. In the first place, there is a marked difference in economy between the small heating boilers and the large heating boilers of from 300 to 500 H. P. found in central stations. Careful tests which have been made on house heating boilers of 25 H. P. under test conditions show an average efficiency somewhere in the neighborhood of from 40 to 50 per cent. It is probable that under ordinary working conditions the percentage would be even less, perhaps might fairly be assumed at 35 per cent. There are a great many tests on large size boilers which show efficiencies running between 70 and 80 per cent. If we assume an average working efficiency on the larger sizes of boilers of 65 per cent, we would have right here a difference of nearly 100 per cent between the pounds of steam per pound of coal secured in a large installation as compared with the results in a small house heating installation.

Furthermore, small residences and stores find it somewhat impracticable to burn soft coal and usually adopt anthracite on account of its comparative cleanliness, reduced danger from explosive gases, and the greater ease of controlling the fire. While there is not a very great difference in the amount of heat producing units contained in the anthracite and the better grades of bituminous coal, the anthracite costs fully 100 per cent more.

Multiplying these two factors together, we find that the ordinary householder will pay four times as much money for a given amount of heat units produced in his boiler as the central station manager would have to pay for the same number of heat units. In such cases, therefore, there is a saving in central station operation which can offset a considerable expense through fixed charges on investment, distributing losses, etc., and still leave a margin of profit for the station.

In the business centers of large cities like Chicago and New York, however, the conditions are very different. The tall office buildings found in the downtown sections are equipped with boilers ranging from 100 to 400 H. P. capacity. Their efficiency will probably average at least 55 per cent. They are supplied in most cases with automatic furnaces which are adapted to the use of the cheaper grades of soft coal. The only advantage, therefore, to be gained from the coal standpoint would lie in the comparatively small difference in efficiency, between the medium size boiler and the very large boiler. But this is not all. While we have gained only a comparatively small amount in efficiency by the substitution of central station boilers, the difficulties of steam transmission in a large city like Chicago, where the streets are already occupied with pipes and conduits for various other utilities, make the cost of transmitting the steam very high.

From time to time estimates have been prepared on the cost of installing a large steam generating plant in Chicago, but thus far no one has seemed to be able to figure out enough profit from the operation of the larger plant to offset the heavy investment expense that would be required. It has, therefore, been the policy of the steam company in Chicago to operate steam plants for only a very limited territory, using one set of boilers for a single building or for several adjoining buildings.

The accompanying sketch, Fig. 1, shows a map of the loop section of Chicago, and gives a fair idea of the various heating plants operated by the Illinois Maintenance Company. It will be noted that in a number of cases several buildings have been connected to one set of boilers, while each building—as a rule—retains its own boiler, or boilers, for use in case of emergency or in extremely cold weather. Although in some instances the company operates boiler plants for single buildings, these contracts were taken with a view to combining the building with other buildings in the vicinity as soon as contracts could be negotiated.

This company secures to a certain extent the same advantage in the employment of labor that is obtained by a central plant. All the boiler plants are under the supervision of a first-class operating engineer, who employs the men. This man, whose title is general engineer, visits all of the plants daily, watches the general upkeep and the handling of the boilers by the men, and also keeps close account of the consumption of coal. He has an assistant, who acts not only as assistant in visiting the plants, but also as an emergency man to assist in any plant that may be temporarily shorthanded. This assistant also makes night inspections of the plants to see that the night engineers are as strict in the performance of their duties as the men on the day shifts. The entire operating department is under the charge of a superintendent, who reports directly to the manager of the company. It is the duty of the superintendent to keep a general supervision over all the plants, visiting them from time to time, and paying special attention to coal deliveries, so as to insure the proper amount and quality of coal in each plant.

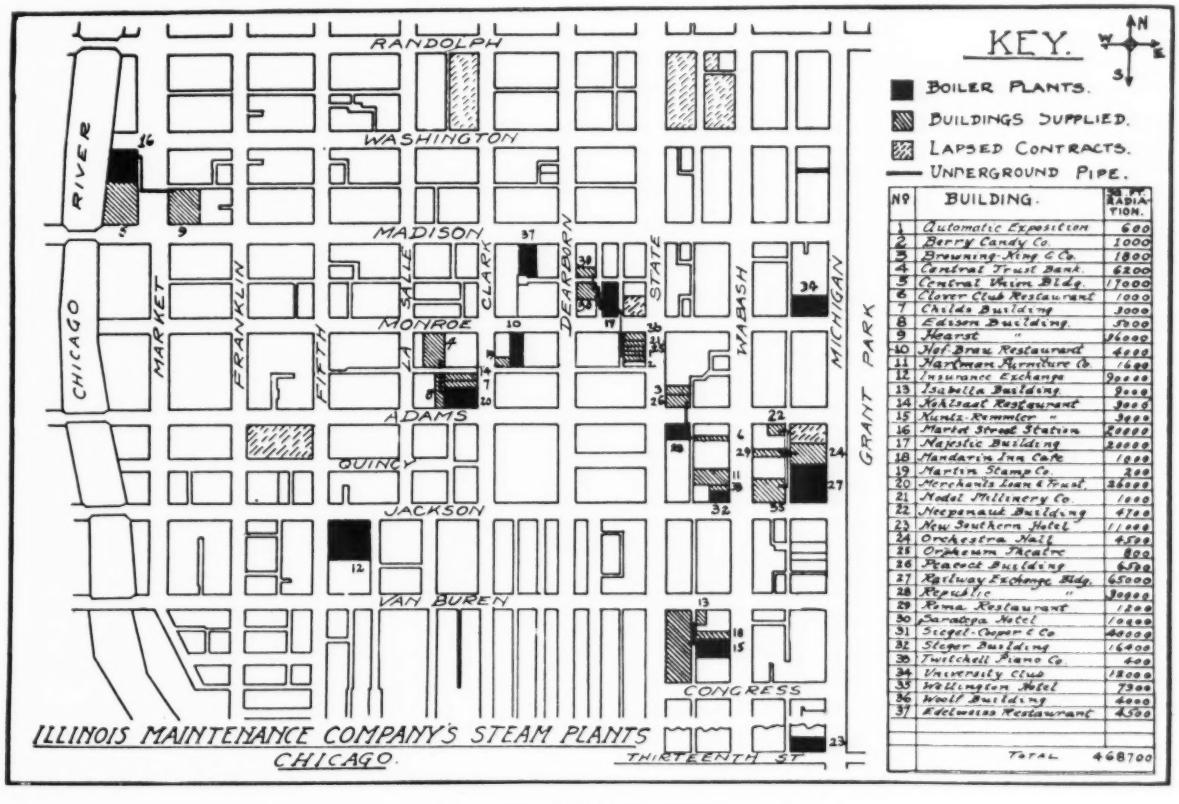
While the company patronizes the local coal companies in the city, it does not depend entirely upon them, but main-

tains an independent coal yard and supplies a large part of its coal from this source. The coal is bought by the carload and delivered from the team track, or from the storage pile maintained in the yard, direct to the plants.

The company originally operated entirely on flat rate contracts, furnishing steam service to each building at a certain fixed price per year. This method of selling steam has been unsatisfactory, and the contracts are being changed as fast as practicable to a meter basis. In the smaller buildings one of the ordinary types of condensation meters is used, while in the larger buildings steam is measured at high pressure by means of St. John meters.

At first there was some difficulty in persuading customers to purchase steam on a meter basis, owing to their ignorance of the cost of steam and also of the time being to connect buildings on opposite sides of a street or alley. As the field of the company's operations gradually extends, there will probably be a somewhat more elaborate system of street connections installed, the plan being to shut down some of the plants which are now running all summer long, in order to cut down the cost of labor.

The company found at first some prejudice on the part of customers against the idea of turning over their boiler plants to an outsider for operation. This prejudice, however, has very largely disappeared, and some of the best architects in the city advise their clients to turn over their heating plants to the company for operation. The company has thus far been very fortunate in operating a



No	BUILDING.	SQ. FT. RADIATION.
1	Automatic Exposition	600
2	Berry Candy Co.	1000
3	Browning-King & Co.	1800
4	Central Trust Bank.	6200
5	Central Union Bldg.	17000
6	Clover Club Restaurant	1000
7	Childs Building	3000
8	Edison Building.	5000
9	Hearst "	96000
10	Hof Brau Restaurant	4000
11	Hartman Furniture Co.	1600
12	Insurance Exchange	90000
13	Isabella Building	9000
14	Kohlsaat Restaurant	3000
15	Kuntz-Remmler "	3000
16	Marin Street Station	20000
17	Majestic Building	20000
18	Mandarin Inn Cafe	1000
19	Martin Stamp Co.	300
20	Merchants Loan & Trust	26000
21	Model Millinery Co.	1000
22	Needanauk Building	4700
23	New Southern Hotel	11000
24	Orchestra Hall	4500
25	Orpheum Theatre	800
26	Peacock Building	6700
27	Railway Exchange Bldg.	65000
28	Republic "	30000
29	Roma Restaurant	1200
30	Saratoga Hotel	10000
31	Siegel-Cooper & Co.	40000
32	Steger Building	16400
33	Twitchell Piano Co.	400
34	University Club	12000
35	Wellington Hotel	7300
36	Woolf Building	4000
37	Edelweiss Restaurant	4500
	TOTAL	468700

Fig. 1.

amount of steam required. The company during this past year has prepared a printed form of contract which includes a sliding scale of rates for steam, and it has been very much easier to close contracts on a meter basis since the adoption of the printed form. A number of contracts have been closed on a meter basis this last year, and one large contract for a building containing upwards of 90,000 sq. ft. of radiating surface has been signed up and the business taken on in the past month.

The rates charged by the company for steam are considerably lower than the meter rates in New York and other large cities. This is due mainly to the fact that the company has little or no investment costs on which to figure a return.

Thus far there has been very little steam piping done in the streets, most of the work done up to the present number of plants without serious mishaps. More than fifty boilers are now in charge of the company, but probably less than half of these are in use at any one time, on account of the method of operation.

The experience of the company in operating boiler plants has shown that the average steam plant in a store or office building is operated with considerable waste and that careful superintendence will show economies which, taken together, will amount to a considerable sum. These economies, however, are largely offset by waste on the part of a customer when steam is sold on a flat rate basis.

The operation of these plants has not thus far been financially successful. The line of work being a comparatively new one, there were a great many things to be learned by experience, both in handling the plants

and in negotiating with customers. The net loss in operation, however, has been gradually reduced, and the outlook for the company appears to be more promising now than at any time since it was organized.

Some one has called this system of heating "Heating from Decentralized Plants." This is true only to a very limited extent. The work of the company would more properly come as a division under the head of "District Heating," only the districts are much smaller than those usually served from heating stations. It is expected, however, that as the plans of the company develop, some of these districts will be considerably enlarged and that from year to year additional buildings will contract for their heating from these centers.

For example, in the case of the Insurance Exchange Building on Jackson Boulevard and Fifth Avenue, there are now installed four 350 h. p. boilers. Space has been provided, however, so that this installation can be considerably increased, if desired. The stack and breeching have been designed of a capacity for nearly 3,000 h. p. Negotiations have already been entered into with some of the surrounding buildings to provide steam from this source, and as the company has a long term contract with the building, it will probably be able to connect other buildings to this center.

Another typical plant is that of a large department store which, in addition, supplies steam for an adjoining office building and two restaurants.

Under the present method of operating the heating company is more in a position to negotiate for steam service than it would be if it had already installed a very expensive plant and distributing system, which imperatively demanded customers in order that it be maintained. It is natural that the customer would endeavor to secure his steam service as cheaply as possible, and where the customer owns an independent plant already in operation he is in a position to be somewhat independent in his negotiations.

The matter of running pipes underground has been quite a serious question in the operation of these plants. Apparently from the nature of Chicago soil some methods of installation which have given fairly satisfactory service in other cities deteriorate here very rapidly, and it has been found that in a very few years after the pipes have been installed there has been left nothing but the iron pipe and the concrete. The iron pipe also seems to be attacked more or less, either by acids or electrolysis, and in several cases it has been necessary to replace the pipe or to install a smaller pipe within the original pipe.

A year ago the company installed an 8-inch pipe line, 300 feet in length, connecting the boilers in the old Edison Building on Market street to the boilers in the new office building erected at Madison and Market streets for the Chicago American and Chicago Examiner. Where the line crosses the street it was laid at an average depth of nine feet. A tile sewer drain was first installed, in gravel, and over this was laid a bed of small rock and sand, to promote drainage. This was covered by a bed of reinforced concrete, in which were embedded roller bearings for the piping. The pipe was incased in a wrapping consisting of two thicknesses of 1-16 inch sheet asbestos paper. This was painted with special tar paint. A dead air space of one inch intervenes between the asbestos covering and a paper felt conduit one and one-half inches in thickness and lined on the interior with sheet tin. About this covering were two layers of tar felt paper completely covering the line. This covering also was painted with special tar paint. Outside of this covering was a casing of reinforced concrete three inches in thickness.

The operation of the line thus far has been very successful. The steam service has been continuous without any interruption. No appreciable leaks have developed, and the loss through condensation in the transmission line has only amounted to 300 pounds per hour. Inasmuch as the steam transmitted in cold weather is about 10,000 pounds per hour we have a fairly satisfactory percentage of efficiency in transmission.

When the heating company was first organized many were inclined to regard the plan as more or less impracticable. Criticism was freely circulated against the little company, and many prophesied complete failure of the undertaking. In spite of opposition from engineers and others, the company has gone steadily forward; and while its growth has been slow, there has been a gradual increase from year to year. During the past three or four years there have been many gratifying proofs of the growing appreciation of this service on the part of the public, the business of the company being today nearly twice what it was three years ago.

The first contracts made by the company were of comparatively short duration, the longest being for five years. Some of the more recent contracts entered into during the past few years have covered a period of from ten to twenty years. This, of course, insures a more permanent basis of operations in making combinations between adjacent plants.

On referring to Fig. 1, showing the map of the loop district, it will be noted that the connected radiation amounts to less than 500,000 sq. ft. The steam service of the company, however, is considerably more extensive than this would indicate. More than thirty elevators, ice machinery, pumps, hot water heaters, and other apparatus give a summer load requiring a coal consumption of upwards of 2,000 tons per month. In other words, nearly half the consumption of coal of the company is for other purposes than serving radiators. Expressing the steam demands on the company, therefore, in terms of radiation, we find that the steam requirements to be met are equivalent to over 800,000 sq. ft. of radiation.

The management feels that there is still room for a great deal of improvement, and also that there is still very much to learn. It is a question of considerable interest, as our large cities grow older and more compactly built up, as to what extent the theory of combination and co-operation will be applied to the production of heat, light and power in large buildings. As between the advocates of large central sources of supply and the advocates of entirely decentralized operation, it is possible that there may be some middle ground along the lines of which the greatest economy can be secured. It is in an effort to discover this middle ground that the above scheme of operation is being gradually extended.

A Genuine Old Master.

"You can assure me that this old master is genuine?"

"Oh, yes, my dear sir. The proof is perfect. Why, I can point out to you the very street in which the poor old master lived."

"And are you sure he was an old master?"

"Sure! Why, my dear sir, he was more than 90 years old when he died."

"I'll take it."—Cleveland Plain Dealer.

Son—Oh, papa, I've broken a window.

Well—I'm busy now. Remind me about it later, and I'll give you a whipping.—Fliegende Blaetter.

Master Plumbers of Several Cities Enjoy Outings

A VISIT TO PITTSBURG'S SANITARY INDUSTRIES MADE BY THE MASTER PLUMBERS OF CANTON, OHIO.

An Interesting and Instructive Outing.

Departing from its usual custom of holding an annual picnic, it was decided at a recent meeting of the Master Plumbers' Association of Canton, O., that the members visit some large city, instead, and make a tour of an educational nature, visiting some of the large industries pertaining to the sanitary field. When this news reached Pittsburg, an invitation was immediately extended by the Iron City Sanitary Mfg. Co. and by the Bailey-Farrell Mfg. Co. to the Canton Association to visit Pittsburg and inspect some of the manufacturing establishments in the plumbing and kindred lines, located in that vicinity. This invitation was heartily accepted by the master plumbers, and arrangements were made to make the trip to Pittsburg.

Thirty-two of the leading master plumbers, including the president of the Canton Association, F. W. Sponseller, and secretary, W. A. Gibb, arrived in Pittsburg at 9:05 on Tuesday morning, August 13, where they were met by Messrs. Kelly, Bryar, Hester, Myers and a number of the Pittsburg master plumbers, representing the Pittsburg Association, including W. H. Rowswell, president; E. M. Tate, secretary; John M. Tate, the veteran master plumber of 126 Second Avenue, and Maurice Martin. Owing to the short notice and press of business, Sheldon S. White, past president of the Pennsylvania Association, and M. Purtill, past president of the Pittsburg Association, were unable to attend.

The entire party was immediately escorted by John Kelly, secretary of the Iron City Sanitary Mfg. Co., C. F. Myers, of the sales department of the company, and W. B. Bryar, general manager of the Bailey-Farrell Mfg. Co., to the special excursion car and left for Zelienople on the Harmony route, to visit the plant of the Iron City Sanitary Mfg. Co. A caterer had been engaged and an excellent luncheon was served en route which was highly appreciated by all on board the car. The beautiful ride through the country proved extremely enjoyable to the Canton master plumbers and the escort, and it may be imagined that the appetites of all were whetted up to the top notch. Arriving at Zelienople, the party was escorted to the Iron City works by Messrs. Lose and Danvers, the managers, who took great pride in showing them through the plant. All viewed with great interest the process of manufacture of the well known "Iron City" enameled bath tubs, lavatories, sinks, tanks, laundry trays, etc. The visit to this great plant proved full of surprises to the Canton party. They had realized, of course, the importance of the Iron City Sanitary Mfg. Co. as a factor in the manufacture of high grade and up-to-date patterns of enameled ware, but they had not conceived that the factory had been planned upon such a large scale. The enameling rooms, the large foundries, the decorating department, the cleaning rooms, the crating departments and other features of interest were inspected with expressions of amazement.

At 6 p. m. the party returned to Pittsburgh after enjoying the day's outing to the fullest extent. They went to the Fort Pitt Hotel where a special dinner was prepared for them, and spent the night at that hotel.

Master Plumbers of Canton, O., on Unique and Instructive Outing.

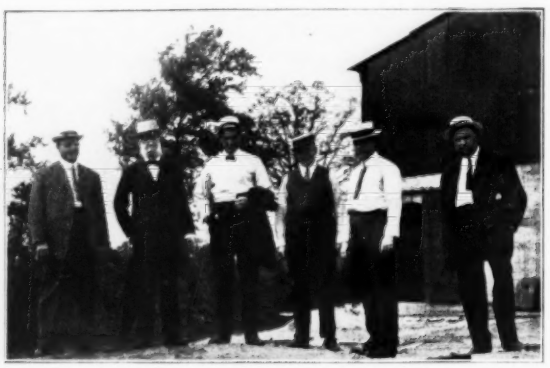
On the following morning, Aug. 14th, the Canton party continued their sight-seeing tour. The plumbing supply establishment of the Bailey-Farrell Mfg. Co., at Third Avenue and Ross Street, was visited, and Messrs. Bryar, Hestor, Norton and others escorted them through the big store, showing them their methods of handling large stocks with the minimum of effort, and how a great jobbing business is conducted today.

The party was then entertained by Charles Carothers, manager of the Standard Mfg. Co.'s northern stores, who conducted them through the company's store at 439-449 Water Street, and the Standard show room in the Bessemer building, where they viewed one of the finest exhibits of modern sanitary goods ever placed on display.

Next in order was a visit to the show rooms of the Pittsburg Water Heater Co., at Wood Street and Fourth

Avenue, where the master plumbers were entertained by a clever demonstration of the Pittsburgh water heater. Tom Boss and Edward Krah were genial entertainers and made the plumbers feel at home in their presence.

The lunch hour had now arrived and the plumbers and escort party returned to the Fort Pitt Hotel, where a luncheon was tendered by the Ruud Mfg. Co., in charge of Messrs. Brill and Fairfield, representing that company. F. W. Sponseller acted as master of ceremonies, and on behalf of the Canton Association, expressed hearty thanks to the manufacturers and jobbers of Pittsburgh for their hospitality and splendid entertainment. W. A. Gibb,



With the Canton Master Plumbers at Zelienople, Pa.

secretary, also spoke, and talks were made by Messrs. Bryar, Carothers, Brill and others.

Following the luncheon, the party was escorted in taxicabs to the plant of the Ruud Mfg. Co., at Twenty-ninth and Smallman Streets, where the process of manufacture of the Ruud heaters was explained in detail.

The next point of interest was Forbes Field, where the party was taken as guests of the Pittsburgh Water Heater Co., to witness the double-header game between Pittsburgh and Philadelphia. Ed. Krah, of the Pittsburgh Water Heater Co., filled the tonneau of his new touring car with members of the party and arrived at the park ahead of the taxicabs. It was an interesting game and Pittsburgh won in both battles.

After the ball game the plumbers returned to their rooms at the Fort Pitt Hotel and prepared for the trip home. They left for Canton on the 8 o'clock train, every member of the party having enjoyed to the utmost the two days' outing. The manufacturers and jobbers also enjoyed the visit of the master plumbers and are hoping they will have the pleasure of entertaining them again at some future time.

Those in the party included the following well known and progressive master plumbers of Canton:

F. W. Sponseller, W. A. Gibb, W. H. Harris, C. R. Baechel, W. H. Kaufman, Carl Smallen, J. A. Mills, Otto Piero, R. Firestone, A. Schumacher, A. Fife, D. J. Ahaern, C. Carpenter, Ed. Farsell, H. F. Trushel, A. Baum, R. Pocock, W. Yohe, H. Sponseller, Lee Schumacher, E. Bender, Denny Charmois, James Shorthill, Wm. Schwing, Frank Westrick, F. E. Widder, W. Delaney, A. Wagner, A. Kaufman, R. Spidel and J. F. Meul.

MASTER PLUMBERS OF CLEVELAND HAVE JOLLY TIME AT ANNUAL PICNIC.

Tuesday, August 20th, was set apart by the Cleveland master plumbers, as the one gala day of the year—their annual outing and picnic. Willough Beach Park was chosen as a desirable spot for the occasion on account of its ideal location on Lake Erie, about fifteen miles from Cleveland. At nine o'clock in the morning the six trolley cars, that had been chartered for the day, were well loaded with master plumbers, their families and friends, when they pulled out of the city. The ride to the park was a very pleasant one.

The program for amusement was well arranged and showed much careful study on the part of the committee.

An important event of the day was the fat men's race, and this caused considerable amusement and entertainment for the crowd. The prize was carried away by George Kortz, of the Cleveland Plumbing Supply Co. The fact that the committee on sports barred Adam Welker, of the Welker Supply Co., from the fat men's race, and also that E. W. Fisher failed to enter his name in time for the start, may have accounted for Mr. Kortz's victory, at least that was the opinion held by some who witnessed the race. Another point in favor of Mr. Kortz was that Dave Roberts, who is always hard to beat, was not in very good trim, having just returned from his western trip.

The big feature of the day's entertainment, however, was the ball game between the East side and the West side master plumbers. The placing of this championship pennant had been worrying several of the enthusiasts since the picnic game last year, and fans claim that Eb. Ellen and J. J. Keiper had a perfect right to back their East side team until Eddie Maurer started to swing the bat for the last stand. Eddie had very little trouble locating the ball, and his brother Frank is also very good at the bat. Much interest and excitement prevailed throughout the game, which resulted in the West side team securing the pennant this year.

Some members of the party indulged in their favorite

At the Annual Outing of the Master Plumbers' Association of

sport, fishing. The banner for deep-water fishing was said to be carried away by John Dreese.

The day's outing from start to finish was hugely enjoyed by all who were fortunate enough to attend, especially the ladies and children, who must have remembered the good time they had at the picnic last year, as they turned out in full force. Mr. Warden, of Warden & Lease, had his share of the fun and expressed regret that the next picnic is a whole year away.

Among the guests present were: C. A. Rice and J. C. Anderson, of the E. W. Fisher Co.; Thos. Degan, of the Standard Mfg. Co.; Adam Welker, of the Welker Supply Co.; George Kortz, of Cleveland Plumbing Supply Co.; Ray Blanchard, of the Kennedy Co.; W. G. Stewart, of the Stewart Tank & Mfg. Co., and E. W. Fisher, local representative of the Piau Mfg. Co., of Cincinnati.

After eating the evening luncheon on the grounds, the rather tired, but still jolly and good-natured, crowd boarded the trolley cars for the homeward trip.

TRENTON, N. J. MASTER PLUMBERS PREPARING FOR ANNUAL FROLIC.

The master plumbers of Trenton, N. J., will hold their annual picnic and field day on Tuesday, September 10th, at Hutchison's Pond, near Trenton, and great preparations are being made for the reception of their guests.

ALLENTOWN, PA., MASTER PLUMBERS ENJOY ANNUAL OUTING.

On Wednesday, August 28, the master plumbers of Allentown, Pa., acted as hosts and, with a car load of visitors as their guests, journeyed to Neffsville, Pa., 12 miles distant, for a day of solid enjoyment. The first entertainment feature was a ball game, but the Honorable L. A. Lanigan was accused of being in cahoots with the "upper regions," as the game was stopped in the third inning, on account of rain. While the Salesmen claim victory, we will not commit ourselves. Captain Ed. Seager, however, was quite the real thing, judging from the regalia he carried along with him. They tell us he has been getting ready for this game for a year, which might be possible, as he blossomed forth with such accessories as chest protectors, red shirt, cap, etc. But they had some food on tap and the menu consisted of everything from pig's knuckles to cordials. There was a good sprinkling of salesmen present and the hospitality of their Allentown friends will always be remembered by them most pleasantly.

Easy Enough.

Caller—I'm sorry to find your mistress out. Don't forget to tell her I called, will you?

Maid—No, sir, I'll tell her at once.—Fliegende Blaetter.

ATLANTIC CITY, N. J., MASTER PLUMBERS ENJOY ANNUAL OUTING.

On Friday, August 30th, the master plumbers of Atlantic City, N. J., following their annual custom, closed up shop and took advantage of the opportunity the country surrounding their city offers for recreation. An enthusiastic delegation of supply men arrived early Friday morning and they, with the host of others already on the scene, got aboard special cars for the trip to Hotel Helen, Margate City. Here everything was in readiness and the festivities began. And while there were sack races, hammer throwing contests, quoit matches, etc., the keen interest of the crowd centered in the ball game between master plumbers and salesmen, which ended in "peaceful" fashion with a score of 18 to 12 in favor of the latter, who came down with keen appetites for victory. At five o'clock the clam-bake was served, and for this finale on the program the committee deserves great praise.

As an additional item of news we wish to add that Ed. Yautter, ably assisted by Brother Johnson, of Ocean City, conducted an expedition on his own account, always followed by a string of friends.

It was a delightful day for every one who was fortunate enough to be in attendance.

HONOR MAJOR EDWARD M. MARKHAM WITH DINNER.

On the evening of Saturday, August 24th, the heads of the several divisions of the Engineer Department of the District of Columbia, tendered a testimonial dinner to Major Edwin M. Markham, assistant engineer commissioner, who leaves the District Service in September, to become engineer in charge of certain government work at Memphis, Tenn. Among those present at the dinner were Richard A. O'Brien, principal assistant inspector of plumbing, and J. F. Brady, chief clerk, of the plumbing division, representing the plumbing division; the inspector of buildings, the superintendent of sewers, and the water registrar. General George A. Johnston, commissioner of the District of Columbia, represented the Board of Commissioners, he being the only one in the city on that evening. Major Markham has been connected with the District Service for the past five years, and he has been in immediate charge of the divisions named above, as well as a few others, and it is largely due to his administration that plumbing and building conditions have been improved. It is with sincere regret to the master plumbers generally throughout the District that Major Markham has been transferred, for he has been a man the plumbers could approach when they had a grievance against the plumbing division, feeling that they would be treated both courteously and fairly.

Cleveland, O., Held at Willough Beach Park, on Tuesday, August 20, 1912.

The New Plumbing Ordinance for the City of Cebu, P. I.

(Concluded)

Section 24. Every vent shall be taken from the crown of the fixtures, except for water-closet traps, and each such trap shall be vented from the branch line below the trap and above all small waste inlets, with a vent so connected as to prevent obstruction.

If the vent outlet on the trap of an iron closet is not to be used as a vent, a 2-inch cleanout must be calked in, to close the opening.

Section 25. Every vent pipe shall be run separately above its fixtures, in order to prevent its use as a waste

Section 26. Each vent pipe shall be connected above the highest fixture into the adjacent soil pipe if distant therefrom not more than one meter eighty centimeters If more than this distance from the soil pipe it may be independently extended above the roof. Every vent pipe at point where passing through the roof must show hub clear above roof, and flashing of sheet lead properly calked into hub and soldered to roof.

A vent line shall be, whenever practicable, a direct extension of a soil or waste line.

Main vent risers having a length of four meters fifty centimeters or more shall be connected at the foot with the main waste or soil line below the lowest vent outlet and with no greater angle of connection of run than forty-five degrees.

In all cases where there is only one flush closet, and other smaller fixtures installed on the same run, the main vent pipe must never be less than 4 inches in diameter.

Section 27. The sizes of main and branch vent pipes shall be increased as fixtures are added, as follows:

Diameter Vents. Inches.	Maxim. Length. Feet.	Number and Size of Traps.
1½	25	1 or 2 traps, 1¼ to 2 inches.
2	50	1 to 5 traps, 3 to 4 inches.
2½	75	6 to 9 traps, 3 to 4 inches.
3	100	10 to 15 traps, 3 to 4 inches.
4	150	16 to 25 traps, 3 to 4 inches.
5	200	26 to 40 traps, 3 to 4 inches.

There shall be constructed under the foot of each vertical riser a concrete base of no less than 15 centimeters thickness and 30 centimeters square to serve as a rest.

All straight runs of pipe of considerable length must have cleanouts installed one in every fifty feet. Such cleanouts are installed by means of Y branches and continue at an angle of 45 degrees to the ground surface.

Section 28. No waste or drain pipe shall be of less size than the fixture's trap.

Section 29. In buildings three stories or less in height, the weight of all cast-iron pipe used shall be standard or heavier, and all cast-iron pipe used in stacks and vertical runs shall be standard and the weight not less than—

Inside Diameter. Inches.	Weight Per Lineal Foot. Pounds.	Inside Diameter. Inches.	Weight Per Lineal Foot. Pounds
2	2½	7	15
3	4½	8	17½
4	6½	10	29
5	8½	12	40
6	10½	15	45

Section 30. All cast-iron pipe used shall have cast upon it directly back of the hub of each section, the name, initials or trademark of the manufacturer.

Section 31. All wrought-iron soil, drain, or waste pipe used in a building shall be standard galvanized iron pipes not less than one and one-half inches in diameter and the weight not less than—

Diameter. Inches.	Weight Per Lin Ft. Pounds.	Diam. Inches.	Weight Per Lin Ft. Pounds.	Diam. Inches.	Weight Per Lin. Ft. Pounds.
1½	2.68	3	7.54	4½	12.34
2	3.61	3½	9.00	5	14.50
2½	5.74	4	10.66	6	18.76

All joints in said pipe shall be screwed joints, carefully made up, and the burr formed in each pipe due to cutting shall be completely removed by reaming or filing.

Section 32. A one and one-half inch galvanized wrought-iron waste pipe shall be limited to the drainage of a single fixture and shall not exceed six meters in length. No portion of the run shall be at a less slope than forty-five degrees with all angles made with one-eighth bends.

Section 33. All fittings used in connection with iron pipes shall correspond with them in weight and quality. Fittings on wrought-iron soil and waste lines shall be extra heavy cast-iron recessed and threaded galvanized drainage fittings, tapped with a slope of one vertical to fifty horizontal for horizontal runs.

Section 34. All changes of direction in soil and house sewer pipes shall be made by means of suitable bends, and all connections by means of "Y" branches and one-eighth or one-sixteenth bends.

All connections of lead pipe with iron branches shall be made by means of recessed brass thimbles the full size of the iron pipe calked into the iron with lead and wiped joints, or by what is known as the Raymond ferrule.

No one-quarter bends, no double hub, double "Y," or double "T Y" branches shall be used on horizontal runs, nor shall one-quarter bends or double "T Y" branches be used on verticals. The use of bands, saddles, and sleeves is prohibited.

Section 35. All pipe runs shall be made as direct as possible, and offsets in vertical soil and waste lines shall not be used without written permission.

Section 36. Means shall be provided for thoroughly flushing all soil pipes, drain pipes, water-closets, and urinals. A suitable flush tank of adequate size, provided with a flush pipe not less than one and one-fourth inches in diameter shall be supplied for every interior water-closet, and such tank shall not be used for any other purpose. Public urinals shall have an automatic or a spray flush.

Washout, pan, valve or off-set water-closets shall not be installed, nor shall such closets now in use be maintained if complaint, which upon investigation shall prove to be well founded, has been made by any occupant of the building in which the closet is located, when a bowl or trap or other type of closet aforementioned, or of a straight or oval hopper closet within a building shall be defective, such portion shall not be replaced, but an approved closet shall be substituted for the old fixture.

A straight or oval hopper closet shall not be installed within a building except upon the approval of the District Health Officer.

A straight hopper, if in an insanitary condition upon complaint may be condemned by the District Health Officer, and shall then be replaced by a short hopper closet of approved type, if so ordered.

Whenever a water-closet of prohibited type shall be replaced the adjacent small-fixture wastes and vents shall be reconstructed so as to bring them into reasonable con-

formity to these regulations, and the soil stack shall be extended above the roof level.

Section 37. Every porcelain water-closet shall have a lead or brass connection.

The weight of a four-inch bend for a closet connection shall not be less than eight pounds per running foot.

Section 38. Wash trays, sinks, and slop hoppers of wood or other absorbent material are prohibited inside of any building unless lead, brass or copper lined, the lining to be water-tight.

Section 39. When any water supply is not ample for thoroughly flushing water-closets, urinals, and other fixtures, a tank or cistern into which water may flow at night, or into which it may be pumped, shall be provided when ordered by the District Health Officer.

Section 40. No waste pipe from a refrigerator or other receptacle in which provisions are stored shall be directly connected with any drain, soil, or other waste pipes; such waste pipes shall be so arranged as to admit of frequent flushing and shall be as short as possible.

Rain-water leaders, when placed inside of a building, must be of cast-iron, properly secured and calked with oakum and lead, or of wrought iron, secured as if they were to be used as soil or waste pipes.

No rain-water leaders, yard drainage, or any drainage containing rain water may enter a house plumbing system.

Section 41. When plumbing in any premises shall be ready for inspection and testing the master plumber in charge of the work shall notify the District Health Officer or his authorized representative.

All soil, waste, and vent pipes for new buildings shall have the lower openings stopped with test plugs of approved type and a test applied by the plumber in the presence of the District Health Officer or his assistant consisting of all pipes being filled with water to the highest vent stack and remain for such a length of time as to satisfy the latter that the work is sound and tight.

There may be substituted for testing horizontal lines or drains a water-pressure test under a head of at least five feet in lieu of the test above specified.

Section 42. Upon the order of the District Health Officer or his authorized assistant any services or drainage pipe laid and covered without inspection and approval shall be promptly uncovered by the master plumber holding the permit for doing the work.

Section 43. Each house sewer and the connection thereof with the public sewer shall be inspected by the District Health Officer or his technical assistants.

Section 44. All pipes shall be properly hung or secured with pipe hooks or straps of heavy g. i. sheet iron. No nails, wire or rope shall be used in fastening.

Section 45. If any master plumber, upon being notified by the District Health Officer or his authorized assistant, that the work installed by him is not in accordance with the provisions of this ordinance, refuses to change same, applications made by him for new work will not be considered and no permits therefor issued until such faulty work or installation has been rectified to the satisfaction of the District Health Officer or his authorized assistant.

Section 46. A certificate of approval shall be issued by the District Health Officer or his authorized assistant to the master plumber upon the satisfactory completion of any plumbing work. The plumbing system shall not be used before the issuance of the final certificates for the plumbing thereon.

Section 47. No water-closet shall be placed in any sleeping room or kitchen, or in any room, or apartment, not in direct communication with the external air by means of a skylight, or a window, having an area of at least one-fourth of a square meter for the admission of light and fresh air.

When two or more flush closets are installed in one closet room a suitable floor drain must be provided.

Section 48. Whenever a house sewer or drain shall become obstructed or broken or defective, so that sewage or drain water escapes therefrom into the surrounding soil or into adjacent premises, the District Health Officer or his authorized representative shall condemn such defective part and order its repair or replacement.

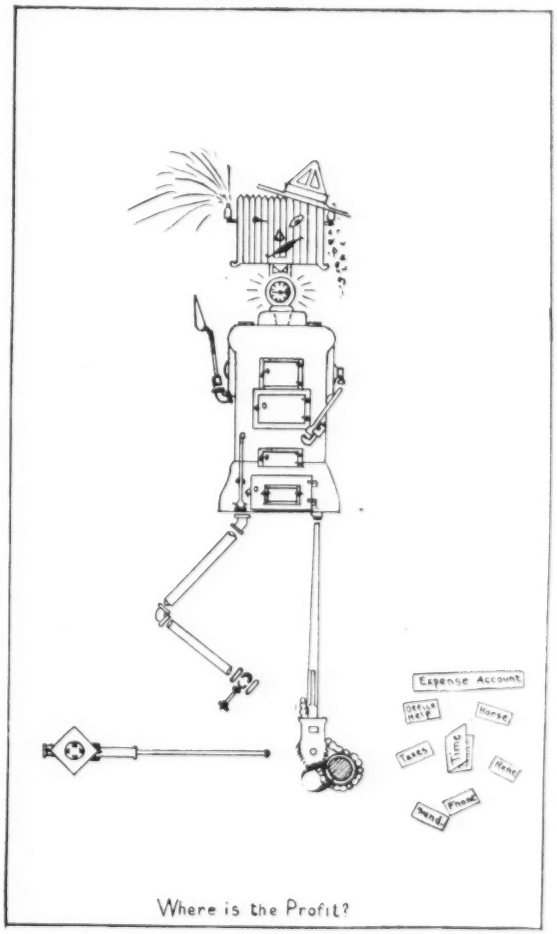
Section 49. Under no consideration shall verbal permission be considered justification for a deviation from the provision of this ordinance.

Section 50. Complaints.—Any person in the City of Cebú who shall violate any part or section of this ordinance or any regulation made in accordance therewith may be proceeded against as prescribed by the provisions of Act numbered fourteen hundred eighty-seven (1487).

Section 51. Fines.—Any persons, firm, company, or corporation who shall violate any provision of any section, or part thereof, of this ordinance, shall, upon conviction, be punished by a fine not to exceed two hundred pesos, Philippine currency, or by imprisonment not to exceed six months, or both, for each offense.

A HEATING QUESTION.

By Thomas Tait.



DISCOVERS FLAWS IN THE OHIO PLUMBING CODE.

In the Ohio Plumbing Code, adopted by the General Assembly during its last session, boards of health, health officials and others interested in the sanitary construction of buildings thought that legislation had been enacted that would enable those charged with supervision of the construction of cesspools, privy vaults and other means of disposing of household wastes to properly control and regulate such constructions.

It seems, however, that we are as far from state regulation as we were before the Code was adopted, writes James E. Bauman, Esq., in "The Monthly Bulletin of the Ohio State Board of Health." The Ohio Building Code Commission adopted and recommended to the legislature for passage a very specific code of plumbing regulations with the thought that this code would apply to all classes of buildings. In drafting the administrative sections of the general building code the law was made to apply to practically all classes of construction but residences, and the Attorney-General has been compelled to hold that the provisions for the construction of cesspools, residential sewage disposal plants and privy vaults do not apply to residences. It is unfortunate that such a ruling had to be given and effort will be made to have the law so amended that the law can be made to apply where it is most needed.

The General Code as it now stands gives to boards of health and building departments authority to regulate cesspools and privy vaults, but there is no uniformity of regulation or enforcement of local regulations. Sections 4420 and 4421 of the General Code are as follows:

"Section 4420. The board of health shall abate and remove all nuisances within its jurisdiction. It may by order therefor compel the owners, agents, assignees occupants, or tenants of any lot, property, building or structure to abate and remove any nuisance therein, and prosecute them for neglect or refusal to obey such orders. Except in cities having a building department, or otherwise exercising the power to regulate the erection of buildings, the board of health may regulate the location, construction and repair of water-closets, privies, cesspools, sinks, plumbing and drains. In cities having such departments or exercising such power, the council by ordinance shall prescribe such rules and regulations as are approved by the board of health, and shall provide for their enforcement."

"Section 4421. The board of health may also regulate the location, construction and repair of yards, pens and stables, and the use, emptying and cleaning thereof, and of water-closets, privies, cesspools, sinks, plumbing, drains, or other places where offensive or dangerous substances or liquids are or may accumulate. When a building, erection, excavation, premises, business, pursuit, matter or thing, or the sewerage, drainage, plumbing, or ventilation thereof is, in the opinion of the board of health, in a condition dangerous to life or health, and when a building or structure is occupied or rented for living or business purposes and sanitary plumbing and sewerage are feasible and necessary, but neglected or refused, the board of health may declare it a public nuisance and order it to be removed, abated, suspended, altered, or otherwise improved or purified by the owner, agent or other person having control thereof, or responsible for such condition, and may prosecute them for the refusal or neglect to obey such order. The board may also, by its officers and employes, remove abate, suspend, alter, or otherwise improve or purify them and certify the costs and expense thereof to the county auditor, to be assessed against the property, and thereby made a lien upon it and collected as other taxes."

A careful reading of Section 4420 will show that a board of health can adopt regulations as to the location, manner of construction and repair of water-closets, privies, cesspools, sinks, plumbing and drains. The only exceptions to the authority of the board of health in these matters is in cities as have created building departments. Where in a city, a building department has been created the power of regulation as to location, construction and repair is vested in the head of the building department. This section leaves with the board of health the abatement of a nuisance caused by failure to keep a cesspool or privy vault in a sanitary condition.

Section 4421 gives to local boards of health power to regulate the use, emptying and cleaning of water-closets, privies, cesspools, etc., and carries sufficient authority to condemn any such place when in a condition dangerous to life or health and order it removed, abated, or otherwise changed as in the judgment of the board of health is found necessary.

Too often little attention is given by the board of health or council in selecting a suitable place for a dump ground. In many cases it has been thought necessary to find a location where a stream of water was convenient into which wastes could be thrown with the result not only of creating a nuisance at the site, but all along the stream.

In this connection the following section of the Ohio law will be of interest as restricting the disposal of municipal wastes:

"Section 12649. Whoever puts the carcass of a dead animal or the offal from a slaughter house, butcher's establishment, packing house or fish house, or spoiled meat, spoiled fish, or other putrid substance or the contents of a privy vault, upon or into a lake, river, bay, creek, pond, canal, road, street, alley, lot, field, meadow, public ground, market space, or common, or, being the owner or occupant of such place, knowingly permits such thing to remain therein to the annoyance of any citizen or neglects to remove or abate the nuisance occasioned thereby within twenty-four hours after knowledge of the existence thereof, or after notice thereof in writing from a road superintendent, constable, trustee or health officer of a municipal corporation or township in which such nuisance exists or from a county commissioner of such county, shall be fined not less than ten dollars nor more than fifty dollars, and in default of the payment of such fine and costs, shall be imprisoned not more than thirty days."

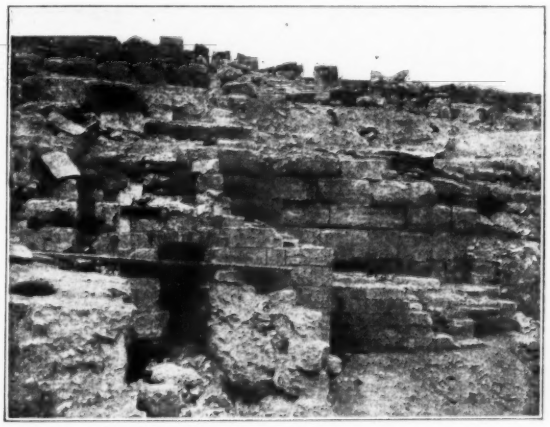
"Section 12650. The preceding section shall not prohibit the deposit of the contents of privy vaults and catch basins into trenches or pits not less than three feet deep excavated in a lot, field or meadow, the owner thereof consenting, outside of the limits of a municipal corporation and not less than thirty rods distant from a dwelling, well or spring of water, lake, bay, pond, canal, run, creek, brook or stream of water, public road or highway, provided that such contents so deposited are forthwith covered with at least twelve inches of dry earth; nor prohibit the deposit of such contents in furrows, as specified for such trenches or pits, to be forthwith covered with dry earth by plowing or otherwise, and with the consent of the owner or occupant of the land in which such furrows are plowed."

If boards of health, and health officers who serve in place of boards of health, will rigidly enforce the provisions of the above quoted sections, and will avail themselves of the authority they now have, much better conditions will be found in all our municipalities and townships.

INTERESTING DRAINAGE SYSTEM OVER THREE THOUSAND YEARS OLD.

Dr. A. J. Evans, the chief of Cretan explorers, recently discovered the site of the Great Palace of Minos, at Knossos, near modern Candia, and the result of his explorations has brought to light the very high state of civilization enjoyed by the ancient Cretans, 3,500 years ago. The Rev. James Baikie, of Edenburg, has written a book summarizing the discoveries of Dr. Evans, entitled, "The Sea-Kings of Crete," Adams and Black, publishers, (New York, The Macmillan Co.), from which the National Geographic Magazine has abstracted the following article which will be especially interesting to our readers:

Most surprising was the revelation of the amazingly complete system of drainage with which the palace was provided. The gradient of the hill which underlay the domestic quarter of the palace enabled the architect to arrange for a drainage system on a scale of completeness which is not only unparalleled in ancient times, but which it would be hard to match in Europe until a period as late as the middle of the nineteenth century of our era. A number of stone shafts, descending from the upper floors, lead to a well-built stone conduit, meas-

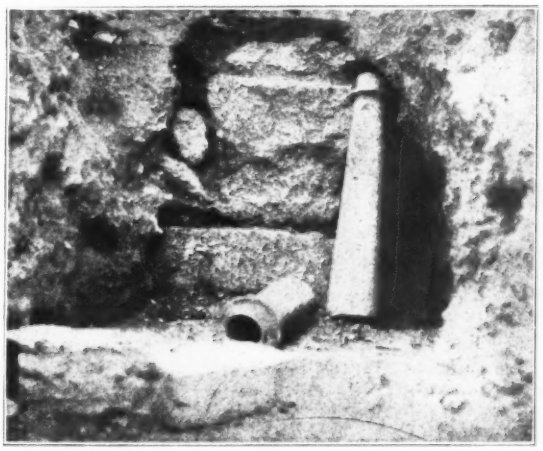


The Old Main Drain at Knossos.

uring one meter by one-half meter, whose inner surface is lined with smooth cement. These shafts were for the purpose of leading into this main conduit the surface water from the roofs of the palace buildings, and thus securing a periodical flushing of the drains. In connection with this surface-water system there was elaborated a system of latrines and other contrivances of a sanitary nature, which are "staggeringly modern" in their appointments.

In the northeastern quarter, under the Corridor of the Game-Board, are still preserved some of the terra-cotta pipes which served as connections to the main drain. They are actually faucet-pointed pipes of quite modern type, each section two and one-half feet in length and six inches in diameter at the wide end, and narrowing to four inches at the smaller end. "Jamming was carefully prevented by a stop-ridge that ran round the outside of each narrow end a few inches from the mouth, while the inside of the butt, or broader end, was provided with a raised collar that enabled it to bear the pressure of the next pipe's stop-ridge, and gave an extra hold for the cement that bound the two pipes together."—Dr. A. J. Evans.

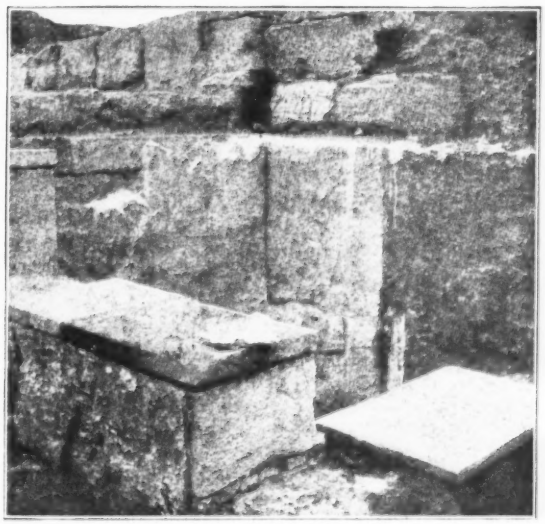
Indeed, the haudraulic science of the Minoan architects is altogether wonderful in the completeness with which it provided for even the smallest details. On a staircase near the east bastion, on the lower part of the slope, a stone runnel for carrying off the surface water follows the line of the steps. Least the steepness of the gradient should allow the water to descend too rapidly and flood the pavement below, the runnel is so con-



Terra-Cotta Drain Pipes, 3,500 Years Old.

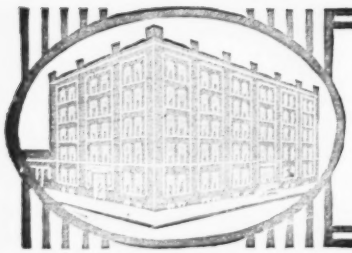
structed that the water follows a series of parabolic curves, and the rapidity of its fall is thus checked by friction.

The main drains are duly provided with manholes for inspection, and "are so roomy," says Dr. Evans, "that two of my Cretan workmen spent days within them clearing out the accumulated earth and rubble without

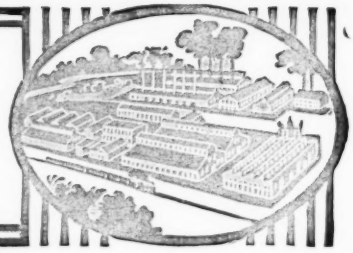


Bathroom in the Palace of Minos, 3,500 Years Old.

inconvenience." Those who remember the many extant descriptions of the sanitary arrangements, or rather the want of sanitary arrangements, in such a town as the Edinburg of the eighteenth century will best appreciate the care and forethought with which the Minoan architects, more than 3,000 years earlier, had provided for the sanitation of the great Palace of Minos.



News of Interest Among the Wholesalers and Manufacturers



HOFFMAN HEATER CO. ERECTS NEW OFFICE BUILDING.

The Hoffman Heater Co. Lorain, O., has started work on the erection of its new office building adjoining its present plant, and it has recently purchased an acre of ground alongside the plant, on which an additional factory building is to be erected.

ESTABLISH DISPLAY ROOMS IN PHILADELPHIA.

The National Radiator Co., of Johnstown, Pa., has opened atractive offices and display rooms at Juniper and Arch Streets, Philadelphia, Pa., under the management of L. A. Lanigan. The company has recently erected a new plant at Trenton, N. J., from which point it will be able to care for the Philadelphia market in prompt fashion.

IN NEW LOCATION.

The American Tin & Terne Plate Co., Philadelphia, Pa., has moved its entire business to a new location at Twenty-fourth and Vine Streets, where nearly an acre of land is to be occupied. The company's plumbing supply department is under the management of E. H. Neely and, with these enlarged facilities, he will no doubt make that department an important factor in the Philadelphia plumbing trade.

HAS HANDSOME SHOWROOM IN NEW QUARTERS.

What is considered to be one of the most attractive display rooms in the heating trade has just been opened by The Pierce, Butler & Pierce Manufacturing Co., of Syracuse, N. Y., in the new Abbott building, at Broad & Race Streets, Philadelphia, Pa. Approximately twenty boilers in addition to radiators and accessories, are on display and the arrangement of this material, as well as the interior decoration of the room, itself, is a credit to the company. E. H. Giles is manager of the company's business in Philadelphia, which has been conducted at 936 Arch Street.

PERSONAL MENTION.

The many friends of Archie M. Maddock, of Thos. Maddock's Sons Co., of Trenton, N. J., will, no doubt, be surprised to learn that he is soon to join the ranks of the benedicts. His marriage to Miss Helena M. Ashton, of Overbrook, Pa., will take place on October 17th in Philadelphia, after which Mr. and Mrs. Maddock will sail from New York on a trip around the world.

* * *

A. T. Snoke has been appointed sales manager for the Knott Manufacturing Co., of Fort Wayne, Ind.

James C. Matchett, formerly supervising salesman for the McCrum Howell Co.'s vacuum cleaner department, has become associated with the Illinois Engineering Co.'s Chicago office. Mr. Matchett, who is a graduate of Armour Institute and a recognized vacuum engineer, will add strength to the Illinois Engineering Co.'s organization.

* * *

George Sipple has resigned his position as traveling salesman for the Zander Plumbing Supply Co., of Buffalo, N. Y., to accept a position with the United States Radiator Corporation as traveling salesman in Western Pennsylvania. Mr. Sipple's former employers join us in wishing him success in his new field. "Let George do it." He can!

* * *

Thomas Kelly, of Thomas Kelly & Bro., Chicago, was registered last week at the Hotel Rudolf, Atlantic City, N. J., where he has been paying his annual visit to that famous resort by the sea.

* * *

The many friends of Robert J. Williams, manager of the New York office of Stanley G. Flagg, Philadelphia, Pa., will be glad to learn of his recovery from a recent illness.

* * *

C. M. Stokes, sales manager of the Norristown Magnesia & Asbestos Co., Norristown, Pa., has just returned from a three weeks' pleasure jaunt in Maine.

* * *

Jack Seitz has been appointed traveling representative for the Zander Plumbing Supply Co., of Buffalo, N. Y. He will cover Western Pennsylvania.

THE AUGUST TOURNAMENT OF THE WESTERN TRADE GOLF ASSOCIATION.

Twenty-four husky warriors, some in armour, some in war paint, and some in uniform, turned out to battle at the regular monthly tournament of the Western Trade Golf Association, held at the Homewood Country Club, Flossmoor, Ill., August 28th. There was blood in every man's eye, and a murderous resolve in every man's heart to kill the pill.

The forenoon was spent on the nine-hole course, where each man showed his speed and the class in which he belonged. At noon all hands gathered at the lunch table and fed, some gorgeously, some sparingly, and a few with deliberation and great care. Here and there a member might be seen stealthily drawing from his pocket a clipping or booklet to read Dr. Evans on "What to eat before committing murder," or "How to breathe when held up by a band of robbers."

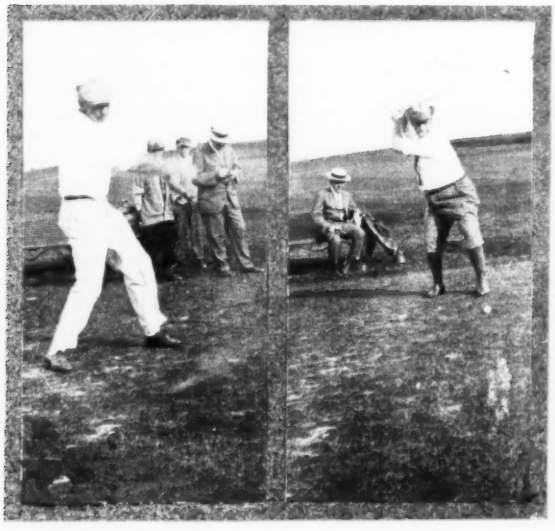
After lunch and a short rest clubs were drawn out and the real battle began on the eighteen-hole course. The flights left as follows: 1st flight, J. D. Hibbard, F. D. Keeler, F. J. Douglas and F. A. Gregory; 2nd flight, H. B.

North, A. K. Root, J. H. Barnard and Jack Craig; 3rd flight, S. O. Dugger, Jno. Blatchford, L. C. Huckins and J. F. Tuttle; 4th flight, D. E. McCabe, W. B. Dale, H. M. Sedgwick and Paul Blatchford; 5th flight, C. D. Little, A. S. Frampton, H. E. Keller and H. S. Martin; 6th flight, A. A. Ainsworth, J. P. Dugger, C. A. Ford and W. T. Morgan.

When these mighty men were all in the field, straining

Paul Blatchford. W. B. Dale.

every muscle at each stroke, Flossmoor was a dangerous place to be in. White balls punctured the clouds, tore through tree tops, penetrated the hills, knocked over fences and drove fish from the brooks. The fray lasted



H. M. Sedgwick. D. E. McCabe.

until six o'clock. When the dust had settled the score card showed F. D. Keeler to be the winner of 1st prize, which entitled him to his name on the association cup and to hold the cup till someone bests him in a future tournament. His score was 80. F. J. Douglas ran a very close second, score 81. The winners were awarded prizes as follows: 2nd flight, H. B. North, score, 82; 3rd flight, S. O. Dugger, score 85; 4th flight, H. M. Sedgwick, score 87; 5th flight, A. S. Frampton, score 87; 6th flight, A. A. Ainsworth, score 94.

After a rub-down everyone was in condition to enjoy the big dinner provided for the occasion. Then J. P. Dugger took the floor and awarded the prizes. The hatchet was buried to be dug up again at the Calumet Club the last of next month.

The score in detail is as follows:

First Flight:	Out.	In.	Gross.	Handi-cap.	Net.
J. D. Hibbard	51	44	95	4	91
F. D. Keeler	39	46	85	5	80
F. J. Douglas	43	42	85	4	81
F. A. Gregory	55	56	111	5	106
Second Flight:					
H. B. North	43	45	88	6	82
A. K. Root	54	48	102	9	93
J. H. Barnard	47	50	97	6	91
Jack Craig	52	45	97	8	89
Third Flight:					
S. O. Dugger	48	45	93	8	85
Jno. Blatchford	52	50	102	8	85
L. C. Huckins	56	57	113	13	100
J. F. Tuttle	54	50	104	13	91
Fourth Flight:					
D. E. McCabe	52	52	104	12	92
W. B. Dale	51	57	108	12	96
H. M. Sedgwick	53	45	98	11	87
Paul Blatchford	54	53	107	13	94
Fifth Flight:					
C. D. Little	57	49	106	17	89
A. S. Frampton	54	45	99	12	87
H. E. Keller	51	54	105	12	93
H. S. Martin	52	54	106	12	94
Sixth Flight:					
A. A. Ainwsorth	59	52	111	17	94
J. P. Dugger	65	66	131	17	114
C. A. Ford	69	60	129	25	104
W. A. Morgan	72	80	152	22	130

ISSUES SPECIAL CATALOGUE.

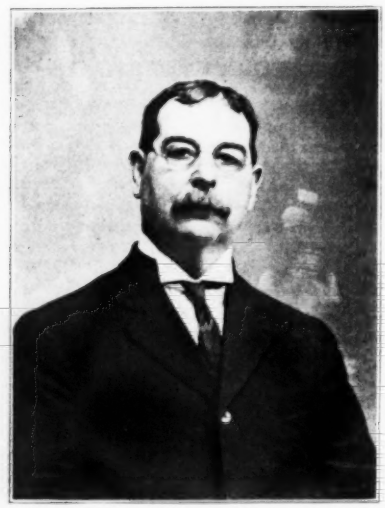
The C. T. Ham Mfg. Co., 71 Parkway, Rochester, N. Y., has recently issued a catalogue calling the attention of the trade to its Auto Silent water closets and Ideal water-saving devices. This catalogue, the front cover of which is shown in the accompanying illustration, is nicely gotten up on the loose leaf plan, well printed on highly glazed paper, and clearly illustrates the different models of the company's product. Reproductions of numerous prominent buildings in which Auto Silent combinations are installed and working successfully, are also contained therein. The many points of superiority claimed by the manufacturers for this closet combination are brought out in a comprehensive manner in

Front Cover Design of C. T. Ham Mfg. Co.'s New Catalogue.

the first few pages of the book. One important feature is the automatic water closet valve which it is claimed cannot get out of order or waste water—on the contrary, it is supposed to save two gallons of water every time operated. This interesting piece of literature should be in the hands of every plumber. If you have not received a copy, a card addressed to the manufacturers, will bring one to you.

THE ANDREW BELL FACTORY KEPT BUSY.

The estate of Andrew Bell is running its plant at 375 Market Street, Newark, N. J., to full capacity. This factory is unique because it is devoted entirely to the manufacture of



Henry R. Bell, of Newark, N. J.

Bell washers and fuller balls. The business was established in 1886 by the late Andrew Bell, who conducted it up to the time of his death in 1910. From the inception, his son Henry R. Bell, has been actively in the business, and he has

The "Bell" Washer and Fuller Ball.

been in entire charge of its affairs since his father's death. The Bell washers are known all over the civilized world, a fact which demonstrates the value of specializing.

THE NEW "DIAMOND N" CATALOGUE AND PRICE LIST.

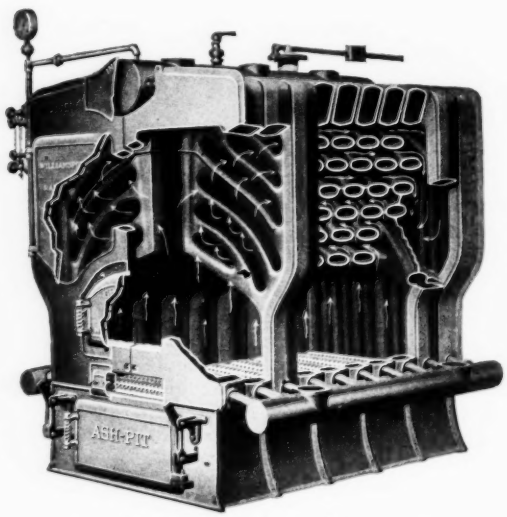
One of the recent catalogues worthy of special mention that has been brought to our attention is the "Diamond N" issued by the Norristown Magnesia & Asbestos Co., Norristown, Pa., manufacturers of pipe and boiler coverings and kindred products. This catalogue is well written and printed in two colors on glazed paper. In its pages are described and illustrated in a comprehensive manner a complete line of "Diamond N" Asbestos-magnesia products, wool felt coverings, conomic boards, asbestos and wool cement, asbestos paper, etc. The book also contains standard price lists of every product manufactured by the company. Heating contractors should be especially interested in this catalogue and can secure a copy by addressing a card to the above named company.

WILL DEAL IN PLUMBING SPECIALTIES.

The Albert P. Hill Co., of Brooklyn, N. Y., has been incorporated with a capital of $10,000 to deal in plumbing specialties. The incorporators are: Albert P. Hill, F. J. Brown and P. Donohue.

WILLIAMSPORT RADIATOR CO'S. CATALOGUE NOW READY.

The Williamsport Radiator Co., of Williamsport, Pa., manufacturers of boilers and radiators, have just prepared a complete new catalogue covering all the goods manufactured by them. This catalogue is now in the hands of the printers and will be ready for distribution this week, and they will be pleased to furnish copies upon request. Many new illustrations are used in this new catalogue and we reproduce herewith one showing the interior construction of their 36 "Craig" sectional boiler. This boiler is of the manifold type and the sections are made in pairs. Attention is particularly called to the large amount of surface exposed to the action of the fire; the low construction of the boiler; the ample fire chamber insuring great efficiency. The line of boilers and radiators made by this company is com-



Interior View of "Craig" Sectional Boiler.

plete and they are prepared to furnish heating apparatus for every kind of a job. The "Williamsport Sun" a local newspaper, has just issued an industrial edition, and, with its usual enterprise and up-to-dateness, the Williamsport Radiator Co. has engaged a large amount of space in this issue for a description of its manufacturing plant. A limited number of copies of this paper will be mailed to members of the trade who send their names to the company's office at Williamsport, Pa.

AN ATTRACTIVE PIECE OF LITERATURE.

The Miller-Hubbard Manufacturing Co. of Sturgis, Mich., has recently sent out a very handsome catalogue, calling the attention of the trade to its solid bent wood high and low tanks, and especially to the new "Invincible" interlocking seat and hinge. This seat is said to embody all the features of an up-to-date sanitary seat, is made with long steel lock bolts that clamp the wood together, on which bolts are also held the hinges for raising the seat and cover. Not a wood screw is used in the seat, and having no hinge leaves on the seat or cover exposed to corrode or tarnish, and being also constructed with a view to durability and neatness, makes it practically indestructible—hence the name, "Invincible Seat." The posts of the hinge that are fastened to the closet are made of steel, and unlike posts or hinges made of cast brass, cannot break. This seat, as well as the

company's bent wood tanks, are neatly illustrated in the booklet. A copy of this catalogue will be mailed to interested parties upon request to the manufacturers.

ISSUES INTERESTING NEW CATALOGUE.

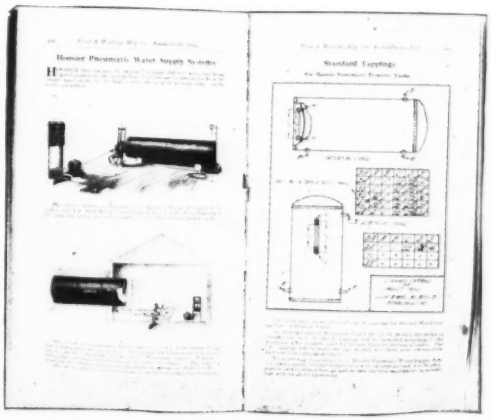
The National Steam Specialty Co., 8-10 S. Clinton Street, Chicago, is mailing to the trade its new catalogue entitled, "Pressure Hot Water Heating," front cover of which is reproduced herewith. The booklet is well compiled and attractively printed in two colors. It clearly describes and fully illustrates the "B" Heat Intensifier, an appliance for adding pressure to hot water heating systems. It is claimed that by the use of this intensifier the boiling point can be raised from 212 to 240 degrees;

Front Cover Design of National Steam Specialty Co.'s New Catalogue.

that it reduces the amount of radiation and that smaller pipes can be used because there are no dead ends or reverse circulation. The catalogue also contains a number of tables of radiation and other matter of the nature requiring future reference, and should be a useful addition to every heating man's library. Readers of "Domestic Engineering" who have not received a copy of this catalogue can obtain same by writing to the National Steam Specialty Co. at the address given above.

FLINT & WALLING MFG. CO. ISSUES NEW CATALOGUE.

Flint & Walling Mfg. Co., of Kendallville, Ind., manufacturers of the Hoosier pneumatic water supply systems and a complete line of water supply goods, is sending out to the trade its new General Catalogue, No. 75, which is a splendid example of catalogue making. It is very attractively printed and nicely bound. It consists of 352 pages, 100 pages more than have ever been shown in any of its previous general catalogues. These 100 additional pages represent improvements and additions that have been made to the company's line of water supply merchandise. This catalogue is a veritable encyclopedia of water supply goods and should be in the hands of every progressive dealer. The accompanying illustration shows the book opened at pages 160 and 161. Many of our readers will be especially interested in that part of the catalogue which exploits the Hoosier pneumatic water supply systems, hand and power pumps, electric motors and Hoosier gasoline engines. Many of the improvements shown in the additional 100 pages in this new general catalog referred to above, were made in the Hoosier systems. A number of new combination air and water pumps and automatic circuit breakers and motor controllers are included. One of the notable additions is the new Fig. 1249 combination air and water hand pump,



Flint & Walling Mfg. Co.'s New Catalogue.

which has a separate air cylinder and water chamber, making it possible to pump both air and water at the same time, or either air or water separately. Plumbers, especially, will welcome such a pump.

CONTRACTS AWARDED.

Middletown, O.—John Arpp, of this city, has secured contract for the plumbing in the court house at Hamilton, O., at a figure of $3,096, also the heating contract for $7,866.

Mechanisburg, Pa.—The school board of this city has awarded the contract for installing the heating system in the Arch Street school building, to the American Heat & Ventilating Co., of Philadelphia, for $2,580.

Shelbyville, Ill.—J. Otto Heinz, of this city, has been awarded the contract for installing a new hot water heating plant in the court house here. His bid was $3,696.

Fort Dodge, Ia.—The Fort Dodge Heating & Plumbing Co. has secured contract for installing a new heating system in the high school building of this city.

Spokane, Wash.—Contract to install a heating system in the Ephrata school has been awarded to Arnold-Evans Co., of this city, at a cost of $1,235.

Columbus, O.—Peter Gehr has secured the contract for the plumbing, heating and ventilating of the addition to the Masonic Temple in this city.

Mankato, Minn.—Contract to install the steam heating plant in the Lutheran ladies' seminary building has been awarded to McLaurin and Northrup, of this city, amounting to over $14,000.

Baltimore, Md.—W. G. Cornell & Co., Fourth Avenue and 17th Street, New York City, have secured contract to install heating system in the court house and city hall of this city at a figure of $51,236.

Chillicothe, Mo.—E. B. Gill has secured contracts for installing hot water heating systems in the residences of J. F. Heger, E. Wells and E. C. Orr.

Dubuque, Ia.—Contract for the heating and ventilating system for the Marshall school has been awarded to L. O. Papin.

THE METAL MARKET

HEAVY BUYING OF SOUTHERN PIG IRON.

Southern furnaces have sold more iron in the last week than in any similar length of time in years. The buying has been for delivery in 1913, and, in almost every case, at higher prices than have been quoted formerly. It started at $12 and quickly advanced to $12.50. There is still some iron for delivery this year for sale at southern points at concessions from $12.50, but this, in the aggregate, is very small and only for this year's delivery. The activity of the week was not confined to the southern markets, for in Cincinnati there were large sales for forward delivery, and, to a lesser degree, in Chicago and Buffalo. The only thing that is preventing a very large melting of iron is the shortage of coke. This seems to grow more serious as time passes, stocks are being drawn on all of the time but it is hoped that labor will be more plentiful in the coke regions in a few weeks. Some of the sales include several lots of 1,000 tons each to melters in New Jersey, 6,000 tons in Milwaukee and 3,000 tons in St. Louis. The General Electric Co. has a large inquiry in the market and the makers of car wheels have been large buyers of high grade iron.

Quotations are as follows:

No. 1 Northern foundry, New York	$16.50 to $16.75
No. 2X Northern foundry, New York	16.00 to 16.50
No. 2 Southern foundry, Birmingham	12.00 to 12.50
No. 2 Southern foundry, Cincinnati	15.25 to 15.75
No. 2 Northern foundry, Chicago	15.50

THE MARKET IN OLD METALS.

Dealers' buying prices in New York are:

Light copper	$13.25 to	$13.50
Strictly crucible copper	15.00	15.25
Uncrucibled copper	14.50	14.75
Uncrucibled copper wire	14.75	15.00
No. 1 brass turnings	9.00	9.25
New brass clippings	10.75	11.00
Cocks and faucets	9.75	10.00
Clean red carboxes	11.00	11.25
Light brass	7.25	7.50
Heavy brass	9.00	9.25
Heavy lead	4.00	4.10
Tea lead	3.75	3.85
Scrap zinc	5.12½	5.25
Close cut solder joints	8.50	9.00

LEAD.

There seems to be a steady business in lead at the higher price of 4.65 cents New York.

FREE BUYING OF COPPER.

Sales of copper in large volume have been made during the last few days. Most of these have been to domestic consumers who are not as well supplied with stocks for November delivery as they should be. The largest consumers, the brass interests, have their requirements pretty well covered but some of the wire makers are not at all well fixed. The principal strength of the situation is the fear, on the part of consumers, that they will get tied up with high metal and see the value melt away as it did in 1907. They are not willing to take the chance of buying a large amount for forward delivery and in consequence come in the market every month, or so, and buy only enough for their needs at that time, but, they have to have the metal then. The time may come when they will have to pay good stiff premiums for the privilege of taking only a little at a time. The prices are unchanged, electrolytic is being quoted at 17.75 cents and Lake at the same figure.

OBITUARY.

Julius E. Zimmerman.

Julius E. Zimmerman, vice-president and general manager of the Standard Tank & Seat Co., 314-318 North Front Street, Camden, N. J., died at his home in Haddonfield, N. J., Tuesday, August 20th, in his 53rd year. He was stricken with apoplexy on August 10th, but hopes were entertained for his recovery until two days before

The Late Julius E. Zimmerman, of Camden, N. J.

his death, when the disease took a turn for the worse. Mr. Zimmerman's connection with the plumbing industry dates back about a quarter of a century when he entered the service of the Ideal Mfg. Co., of Detroit, Mich., in its plumbers' woodwork department. Later he became connected with the Henry McShane Mfg. Co., of Baltimore, Md., as manager of the Baltimore Sheet Metal Works. About twelve years ago he resigned from this position to become vice-president and manager of the Rome Sanitary Works, Rome, N. Y. From there he came to Camden about six years ago as vice-president and general manager of the Standard Tank & Seat Co., a position he held at the time of his death. He was also interested in the Independent Foundry Co., of Emporium, Pa. He had a host of friends in the plumbing trade who will always remember him for his sterling qualities as a conscientious and capable business man. His wife, two sons and two daughters survive him.

Among the Plumbing and Heating Contractors

NEWS FROM THE PACIFIC COAST.

San Francisco.

The number of large contracts taken by plumbers this month is hardly up to expectations, but the outlook for new buildings to be started during the next six months or so is most encouraging. The Exposition work and Civic Center buildings are attracting more attention than anything else, but many private projects of some magnitude will also be ready for figuring very shortly. Preliminary construction contracts have just been let for the new wing of the St. Francis Hotel, the plumbing, heating and ventilating in which will be a matter of some importance; and figures are now being taken on the construction of the Insurance Exchange building, an office structure of the largest class. Construction contracts have also been let on the San Francisco armory, which is to be extremely well equipped with sanitary appliances. Arrangements are being made to take segregated bids on various parts of the new city hall, the idea being to divide the work so as to secure the most rapid progress without confusion. The plans should be ready for figuring within a couple of months, and the U. S. Subtreasury building is expected to come up about the same time. In addition to the municipal auditorium, an opera house costing about half a million dollars is to be erected on the civic center site, and it seems likely that a Carnegie library will also be included in the local public building program. Figures will soon be taken, also, on the Academy of Sciences building in Golden Gate Park. In Oakland, plans are practically ready for the municipal auditorium, and figures are being taken on an addition to the Fremont High School, besides a large amount of other important school work, while plans are under way for several large business buildings.

The new building of the San Francisco Association of Master Plumbers at Page and Gough Streets, which is now practically complete and will probably be occupied about the middle of September, is one of which the local trade may well be proud. The opening will be celebrated by a grand banquet, for which preparations are now being made. The building is a three-story apartment house, faced with yellow pressed brick, and arranged on up-to-date lines in every way. A tenant has been found for the apartment house section, which will bring the association a steady income. The entrance to the association rooms is on the Page Street side, and the rooms themselves consist of a banquet room about 60 by 80 ft., with a well-appointed kitchen; a meeting hall and ball room, with maple floor, about 45 by 65 ft., all finely finished and handsomely decorated, and provided with hat-rooms, toilet accommodations, etc., for both men and women. A commodious and well lighted office is also provided for the secretary of the association. The officers are very glad to get into the new place, as their accommodations for the last several years have been by no means adequate or satisfactory for the needs of an organization of this character. The investment is comparatively large, but with the desirable apartments above the building will more than pay for itself in a short time. An amusing, though rather annoying incident occurred in connection with this building. A dedication stone had been prepared, but was set aside until the building was about finished, and in the meantime it disappeared and another had to be ordered. It was not a thing that a man could easily put in his pocket or hide under his coat, being a granite block of some quarter-ton weight, and who took it is still a mystery.

The Los Angeles plumbers also have become impressed with the desirability of having a home of their own, and according to a recent report from President Crowell, of the Los Angeles Association, a large lot on Main Street has been purchased at a cost of $15,000. The association does not intend to build at once, but will probably do so within the next year or two.

The discussions at the recent state convention are beginning to bear fruit, though nothing very definite has been accomplished along the lines suggested as yet. The committee appointed to confer with a committee from the Hardware Dealers' Association will soon get together, however, and it is expected that arrangements will soon be made by which the two associations can act in harmony concerning matters of common interest. These matters are rather numerous, as many people in California are members of both associations, having both hardware stores and plumbing shops. The discussion at the convention has focused attention more than ever before on the necessity for reform in the matter of giving credit by supply houses, and there are indications that the wholesalers will soon take common action in this direction. The abuses which have arisen under the old system have placed a heavy load on the conservative plumbing firms, and the supply houses have also suffered in many cases, making it practically necessary to work out a more satisfactory basis of credit and discounts.

On complaint of Plumbing Inspector Stephen E. Throwell, of San Mateo, Cal., a building contractor of that place was recently arrested for doing plumbing work without a license. The work was done in the contractor's own buildings.

Figures have just been taken on the installation of a heating and ventilating plant in the Central School building at Ontario, Cal.

The Valley Heating & Plumbing Company is a new corporation at Eugene, Ore., with a capital stock of $5,000.

The city hall of Berkeley, Cal., is to be equipped with a new oil-burning heating system.

NEWS FROM PITTSBURGH AND VICINITY.

Master plumbers in the Greater Pittsburgh district are fairly busy as the autumn season opens, but no excessively large contracts are on tap, with but one possible exception—the Ft. Pitt Hotel. The announcement that the Kaufmann interests plan the erection of a 24-story hotel on the site of the Hotel Griswold in Smithfield Street is creating some interest among the larger plumbing concerns, for it seems certain that this job will "go through all right."

The opening of the Pittsburgh Exposition a few days ago caused the Melott Heating & Furnace Co., with offices at 634 Smithfield Street, to take space there and install a large exhibit. It is the only one of the character in the show. Various kinds of gas and coal furnaces have been tested and ratings have been assigned them by the Federal Furnace League.

The old-fashioned coal stove is fast passing away from the country school houses in Belmont County, Ohio, which is opposite the Ohio river from Wheeling, W. Va., and in their place modern heating appliances are being installed. A contract has just been awarded the Stanton Heater Co., for the installation of modern heaters in twelve country district schools.

The Allegheny County Steam Heating Co. is the name of a new corporation which has just been formed in Pittsburgh during the last week by Alex. W. Stevenson, S. L. Tone, R. S. Orr, J. W. Murray and W. B. Carson, and their charter will be granted at Harrisburg, Pa., September 10th. The incorporators are connected with the Pittsburgh Railways Co., with general offices Sixth Avenue, this city. The company plans to supply heat and power.

Among some of the better plumbing contracts awarded in the Pittsburgh district of late are the following: J. M. Tate received the contract for the warehouse and mercantile building being erected by John C. Fisher and the Scientific Materials Co. Alexander Bros. Wilkinsburg, $4,000 residence being erected in Wilkinsburg by William H. Dean.

McCarthy Plumbing Co., Elwood City, Pa., plumbing in $7,000 business block being erected in Elwood City by S. L. Teemer, of that place. Iron City Plumbing Co., plumbing contract in $20,000 residence being erected for

J. G. White. L. G. Young, plumbing in commercial building being built by Miss Mathilda W. Denny. Beechview Plumbing Co., plumbing in $5,000 church in Beechview being erected by the Reorganized Church of Jesus Christ of Latter Day Saints. John W. Tate, plumbing in new $40,000 residence being built by John O. Oliver, Pittsburgh. A. T. Taylor & Co., Indiana, Pa., plumbing and heating in $12,000 furniture store being erected for Stevings & Streams, of Indiana, Pa.

NEWS FROM PHILADELPHIA.

Champion G. Shuster, 1318 Girard Avenue, has been awarded the contract for plumbing and heating in the Chew operation at Radnor, Pa.

Oscar A. Kahear, 3103 N. 15th Street will make additions and alterations in the plumbing at 2528 N. Bancroft Street for C. H. Windt, and at 1435 W. Clearfield Street for E. R. Magee.

Jas. J. Lawler, 1453 N. 62nd Street, will install plumbing in three new houses, 5119-23 Viola Street, for I. Sherman; also additions and alterations at 532-34 N. 36th Street.

A. H. McClintock, 1936 Ridge Avenue, is having a very busy season. His latest contracts are the heating installation in the Harmor Club and in the Marks Bldg., 719 and 721 Walnut Street.

Hirsch Bros., Tacony, have secured the plumbing and heating contract in six houses in Wissinoming for the Wilmer operation.

W. Davis, 1667 Orthodox Street, Frankford, has been awarded the contract for plumbing in 4 houses, 1696-1702 Meadow Street for H. Swope. He will also make additions and alterations to the plumbing at 4355 Penn Street for D. Conebarn.

Wm. Gould, 338 E. Somerset Street, will install plumbing at 3535-41 Smedlay Street.

D. M. Vanteir, 3183 Belgrade Street, will install drainage systems at 3167-79 Almond Street.

Geo. W. England, 253 S. 5th Street, has been awarded the contract for plumbing in 8 new houses at Rittenhouse Street and Magnolia Avenue for the Octavia Hill Association.

John B. Smith & Co., 148 N. 7th Street, have the contract for installing heating system in the Archbishop residence at Logan Square.

C. T. Innas & Co., 870 N. Franklin Street, will install plumbing in the new building 315 N. 7th Street for Roug & Langsdorf.

Stillwell & Soehle, 2206 N. 29th Street, will remodel the plumbing at 2647 N. 5th Street, 1811 Pike Street and 2126 Dover Street.

Gray & Dormer, 1729 Columbia Avenue, have been awarded the contract for heating the Western Home for Children, 41st and Baring Streets.

Wm. Krouse & Son, 149 Green Street, will introduce plumbing in the properties at 845-53 N. American Street.

E. H. Swallow, 1812 Margaret Street, will install plumbing in the properties at 4471-73 Wingohocking Street for Edward Rowan.

Edward T. Roberts, 2622 Columbia Avenue, has the plumbing contracts in Public Schools, 15th and Brandywine Streets and 17th and Spring Garden Streets, for the Board of Education.

P. Gormley & Co., 155 N. 10th Street, has the contract for heating a factory at Rosemont, Pa.

George Mathen, 2320 Christian Street, will install plumbing in the properties at 2421 Federal Street and 1132-40 S. 24th Street.

Brown & Doran, 2743 N. Front Street, have the contract for heating the Fifth Reform Presbyterian church, Front and Cumberland Street.

W. J. Weir, 1730 Mifflin Street, will make additions and alterations to the plumbing at 10 N. 42nd Street, N. E. Cor. 25th and Federal Streets, 727 S. Isenminger Street, 1824 Tasker Street and 748 S. Martin Street.

Schoellhauser & Roeter, 1314 Ridge Avenue, have landed the plumbing and heating contract for the new building being erected at Broad & Walnut Streets, for the Manufacturer's Club.

Flynn & Love, 1506 Sansom Street, have on hand the following contracts: plumbing installation in the new brewery for Cass & Nachod, at Tenth Street and Montgomery Avenue; plumbing in St. Joseph's Convent, Chestnut Hill and Parish houses for the Jesuit and for the St. Timothy Churches.

J. & B. Oliver have engaged in the plumbing business at 427 Kernlin Street, Chester, Pa., and would be glad to receive catalogues and price lists from manufacturers and jobbers of material in that line.

NEWS FROM TRENTON, N. J.

Trenton, N. J.—The Trenton Plumbing and Heating Co., under the supervision of A. E. Schoeller, at 362 South Broad Street is a busy institution these days. In addition to the plumbing and heating work in a store and three-apartment building on Bellevue Avenue, for I. Wagner, the company has on its books contracts for plumbing work in over seventy houses, all in Trenton.

Trenton, N. J.—John Black, of State Street, who has built up a most lucrative business, has under way the plumbing installation in 116 new houses at Roebling, N. J.

Trenton, N. J.—Geo. W. Earle, of 222 South Warren Street, is enjoying his share of the heating business in this city. To give an idea of what he is doing, we will mention that he is engaged with the heating work in the following structures in Trenton: Hub building, Lavison's store, two new stores on Cooper Street and about thirty residences.

NEWS FROM ROCHESTER, N. Y.

Rochester, N. Y.—Towe & Devendorf, 279 East Avenue, have an imposing list of contracts for heating installations on their books. We will mention a few of these, which include the heating work in the following structures: Iola Sanatorium; Public Schools numbers Thirty-three and Twelve, Rochester, N. Y.; fire house on Stone Street, Rochester, N. Y.; Columbia apartments for Keenan & Keenan, Rochester, N. Y. Ithaca City hospital, Ithaca, N. Y.; Allihang County jail, Belmont, N. Y.; Bell Telephone Company's building, Rochester, N. Y., and about fifty residences in the same city, for different parties.

Rochester, N. Y.—Edw. G. Snyder, 485 East Main Street, is a very busy man these days, and we take this opportunity of publishing a list of his contracts, which will be hard to surpass. The list given includes either plumbing or heating installations, or both. Here it is: Thirty-five houses for John H. Ehrian, at Ludwig Park; Thirty-five more residences in various sections of Rochester for different parties; the Minges block, on Main Street, East; a four-apartment building on Rutgers Street for Miss Mount; the Forman building, just completed, on Clinton Avenue, South, thirty-four houses on Portland Avenue, for John H. Ehrion.

Rochester, N. Y.—Saunders & Nolan, 297 East Avenue, have a good contract under way, in that of the plumbing in Dr. Parson's residence, on East Avenue.

Rochester, N. Y.—Arensmeyer, Warnock, Zahrndt, Inc., have engaged in the plumbing and heating business at 114 Monroe Avenue, as successors to Chas Fisher & Co., their former employers. They have incorporated for $10,000 and have established themselves in attractive quarters at the address given. They would be glad to receive catalogues and discount sheets from manufacturers and jobbers of plumbing and heating supplies.

Rochester, N. Y.—Fred W. Henry, West Avenue, has contracts on hand for the plumbing work in five new residences.

Rochester, N. Y.—Geo. W. Stallman, 479 E. Main Street, has secured contracts for the plumbing installation in the residence of H. E. Reiner, of the Eastman Kodak Company, at Livingston Park, and the hot-water heating system in S. D. Burnett's home on Lake Avenue.

Rochester, N. Y.—Barr & Creelman, Exchange Street, report a busy season. Here are a few of the more important contracts they have under way: heating in a large furniture factory at Medina, N. Y., plumbing in No. Ten school, in Rochester, plumbing and heating in a large factory for the Clarke Paper Co.

NEWS FROM MARYLAND.

At the outset of September, indications in the plumbing trade point to a very busy fall after a summer of not over good business. The cool summer has been a boon to the men on new operations. It can be truthfully said that business at Frostburg is good. Charles F. Brown is the latest to enter the plumbing field and states that prospects for a good fall business are excellent.

Business conditions at Belair are much better than for several years past. This is conceded by even the oldest inhabitant. Charles C. Brown and J. W. Bancroft have recently been granted licenses and say that the future is all that could be hoped for.

F. W. Bell and David Barnes have taken out plumbers' licenses in Cumberland. These gentlemen make an occasional visit to the Baltimore supply houses.

Howard Almeny is the latest accession to the ranks of the plumbers at Whitehall.

Three more plumbers have taken out licenses at Cambridge. Charles Adams, William J. Bishop and R. Lee Browne are the happy men.

W. K. Barrick has entered the plumbers' ranks at Hagerstown. A recent visit to that city reveals absolutely no uneasiness on the part of the plumbers as to the fall business.

Brunswick, which is commencing to put on the airs of a Western boom town, has another plumber added to its list of business men in the person of E. H. Bennett. The Brunswick plumbers job in Washington.

Samuel Artz, R. J. Bassett and William Brennan of Washington have taken out Maryland licenses.

C. M. Briggs is now located at Oakland. That resort has had a very prosperous summer and the hotel men will put a great share of their profits into new plumbing.

Business conditions at Reisterstown seem to be on the move and all of the plumbers' shops report lots of business with the farmers. David Berryman and J. V. Browne are among the plumbers of that town who have recently taken out licenses.

Reports coming from Frederick indicate that section of Maryland is experiencing one of the most prosperous years of its history. The traveling salesmen all say that never before have they seen better looking order sheets than in that town. Among the new establishments those of Wade E. Brown, N. J. Blumanour, George A. Burch and Thomas F. Allen are noticeable. Parson Beldin is the recipient of a license at Salisbury.

A. L. Briggs, of Mountain Park, has taken out a plumber's license.

G. M. Biederman has opened a very neat plumbing shop at 1611 East Oliver Street, Baltimore.

J. A. Brown is now located at 1511 East Chase Street, Baltimore.

G. C. Chenoweth, 1601 East Lanvale Street, Baltimore, is one of the latest to take out a plumber's license.

D. E. Colburn has opened a plumbing establishment at 1602 Harford Avenue, Baltimore.

E. D. Clautice, 17 West 24th Street, has taken out a plumber's license.

Howard Callis is now located at 1810 N. Montford Avenue, Baltimore.

Harry L. Black is now located at 208 West Fayette Street, Baltimore. His son, H. L. Black, jr., 1700 Park Avenue, is also the holder of a license.

F. G. Breyer, 1612 Moreland Street, is among the late additions to Baltimore licensed plumbers' ranks.

John W. Colton has a new plumbing shop at 1404 West Pratt Street, Baltimore.

W. I. Callaghan has opened a plumbing establishment at 1750 Calhoun Street.

Ensor Street, Baltimore, has another plumber, W. J. Clarke having opened a shop at 939.

C. R. Cole, of Hamilton, at the terminus of the Harford Avenue line of electrics, has taken out a plumber's license.

Watseka, Ill.—A new plumbing and heating establishment has been opened in the Harris building in this city by A. E. Post.

NEWS FROM NEW ENGLAND.

Massachusetts.

Pittsfield.—Noble, Milne & Co. have the plumbing contract for the new Willard E. Edminster house on Wendell Avenue and for the new house that Z. Marshall Crane is building in Dalton. The Robbins Gamwell Co. will install the heating system in the latter house.

Lowell.—Charles H. Hanchett & Co. have been given the contract for installing a new steam heating system in the house of hose company 9. There were several other bids all higher.

Groveland.—The contract for heating and plumbing the Perry mansion, which is to be used as a parsonage for the Congregational church, has been given to Frank Whitten, of Haverhill.

Lowell.—Contracts for plumbing and heating in the new city stables have been placed. Farrell & Conaton will install the plumbing and Welch Brothers the heating.

Fall River.—W. H. Whalen has been awarded the contract for installing a heating and ventilating system in the new schoolhouse to be erected at North Westport. His bid was $1,280. Other bidders for the work were: F. E. Earle $1,335.75; Fall River Steam & Gas Co., $1,498; and Nathan E. Miller $1,349.

Lowell.—Desmarais & Bourret have the contract for the plumbing and heating in a two apartment house on Fifth Avenue and a contract for plumbing the house of L. Marion on Sparks Street.

Connecticut.

South Manchester.—Contracts for the new almshouse to be erected here have been placed, the plumbing contract with Thomas Trotter for $1,154, and the heating contract with Ferris Brothers for $1,225.

Bridgeport.—The board of education has for the second time rejected all bids received for installing a new heating system in the Myrtle Avenue school and called for new bids. Four proposals were received of which three were defective.

Bridgeport.—Carlson & Benson have contract for plumbing and heating four houses on Howard Avenue for Miss Bertha Hurlock; houses on Hollister Heights for Miss Halstead; and a house on Bradley Street for Mrs. Ida Bradbury. All are being erected by Contractor George Nordling. Joseph Mullins & Co. will do the plumbing and heating in a house which the same contractor is erecting for Charles Nothnagle, and the plumbing in a house on Boston Terrace for Charles B. Ensign. J. J. Scanlon has been given the contract for plumbing a three-apartment house on Grand Street for Grosso Brothers.

Groton.—The plumbing firm of Sweet & Sandoro has been dissolved. Joseph Sandoro will continue the business. The concern started business about two years ago.

Rhode Island.

Westerly.—The contract for plumbing the new town hall building has been awarded to Robert Drysdale and that for heating and ventilating to Albert P. Randall.

New Hampshire.

Littleton.—The building committee for the Apthorp school has awarded the contract for the heating plant for the building to the Littleton Hardware Co., which was the lowest bidder.

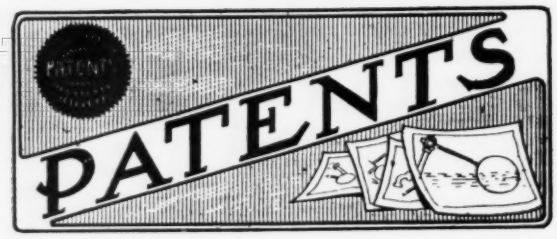
Vermont.

Enosburg Falls.—Plumbers in the employ of the St. Albans Plumbing & Heating Co., of St. Albans, are engaged in installing a modern steam heating system in the laboratory of Dr. B. J. Kendall Co.

BUSINESS CHANGES.

Rochester, N. Y.—F. G. Rossney has recently moved into larger quarters to accommodate his steadily growing plumbing business. He is now located at 185 West Avenue.

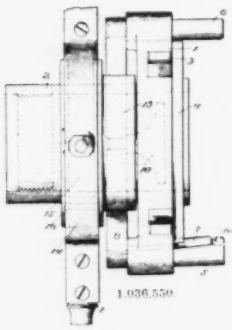
Cleveland, O.—Adolph Look has moved his plumbing establishment from 2101 West 104th Street into his new building which has just been completed at 105th Street and Lorain Avenue.



Heating Department.

1,036,550. Die-Head. Bradford Borden, Toronto, Ontario, Canada, assignor to The Borden Company, Warren, O., a corporation of Ohio. A die-head comprising a chaser-carrier, a series of radially-arranged chasers, a chaser-engaging plate rotatable relatively to the chaser-carrier, means having a longitudinal movement parallel to the axis of the chaser-carrier during the threading operation, such means co-operating with such chaser-engaging plate for controlling the rotation thereof, means for effecting the throw out of the chasers normally at a predetermined point in the threading operation, and means capable of rendering the last mentioned means effective before the predetermined point of operation is reached.

1,036,826. Water-Heating Apparatus. George H. Gibson, Montclair, N. J., assignor to Harrison Safety Boiler Works, Philadelphia, Pa., a copartnership. The combination of a water-heater, a water-supply pipe connected thereto, a steam connection for supplying steam to the heater to mingle with and heat the water supplied by said pipe, a pipe for carrying hot water from the heater to a point of use, a passageway for carrying hot water from the heater, means connected to said passageway for transferring heat from the hot water flowing through the passageway to a second body of water without mingling said bodies of water, a pipe for conveying said second body of water from said means to said water-supply pipe, and a pipe for conveying the other of said bodies of water from said means to the point of use, substantially as set forth.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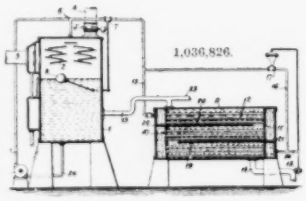
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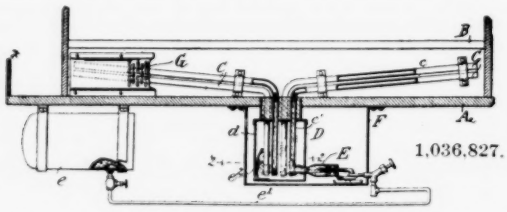
1,037,109.

1,037,109. Pipe-Wrench. William Louis Bessolo, San Diego, Cal. The improved pipe wrench, comprising a fixed jaw and integral shank, a handle having a rule-joint connection with the shank and a pivoted movable jaw having its shank constructed in the form of a segment provided with ratchet teeth, a hook pawl pivoted to the forward end of the handle, and a spring attached to the handle and pressing the pawl normally into engagement with the ratchet, as shown and described.

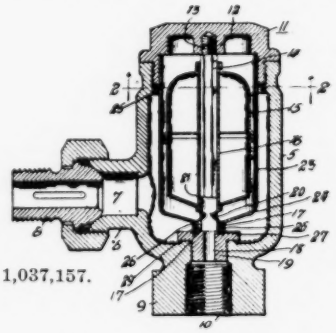
1,036,827. Heating System. Edward E. Gold, New York, N. Y. A non-circulating, radiating, car-heating system, comprising a plurality of sealed pipes, one portion of each of which is situated in a lower plane than the remainder of the pipe and comprises a condensation chamber, the remainder of the pipe rising from said condensation chamber and extending in an approximately horizontal direction through said car and forming a radiator, with a relatively small amount of vaporizable liquid in said condensation chamber and a substantial vacuum in the remainder of the space in said pipe, said condensation chamber providing a liquid holding space having a thickness not greatly exceeding the thickness of the vapor space in the remainder of the pipe, a heater chamber into which the portions of the pipes containing said condensation chamber are placed and wherein said portion of said pipes are arranged in staggered relation, and a hydro-carbon burner alined with said condensation chambers and adapted to direct its flame against them under pressure and adapted to vaporize the liquid therein and to maintain the radiating pipes full of vapor whereby owing to the reduced pressure in said pipes and the relatively small amount of liquid in said condensing chambers a quick radiation of heat may be attained.


1,036,827.

1,036,752. Bracket for Water-Tanks. Frederick A. Tyler, Albany, N. Y. A bracket for a water tank consisting of a back-piece adapted to be attached to the side-wall, shelves extending horizontally from said back-piece, hook shaped flanges extending from said back-piece downwardly above said shelves, a seat adapted to sustain a cylindrical shaped tank, flanges extending upwardly from the sides of said seat and lugs upon said seat adapted to hook under said hook-shaped flanges whereby said seat will be held upon said shelves, substantially as described for the purposes set forth.

1,037,157. Steam, Air, and Water Trap Valve. Fred W. Leuthesser, Chicago, Ill. In a valve of the class described, the combination of a casing provided with an inlet passage and a discharge passage, a cap or cover for closing the upper end of the casing, a float within the casing for governing the discharge passage, a shell dividing the interior of the casing into a water inlet chamber and a float chamber said shell surrounding the float and having its lower end underlying the lower end of the

1,036,752.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float, said shell being provided with an unrestricted air inlet opening near its upper end and having its lower end provided with a centrally located opening constituting a water inlet to the float chamber, said shell having an imperforate body between said openings, means for centering said shell with respect to the discharge passage and for spacing the lower end of the shell away from the floor of the casing to allow unrestricted communication between the water inlet chamber and the discharge passage of the casing, a hollow tube extending through said float and secured thereto, the lower end of the tube, when the float is in normal position, cutting off communication between the interior of the casing and the discharge passage, a fixed guide member entering into said tube, said tube having a passage for air formed between the exterior face of the guide member and the interior face of the tube for permitting air to pass from the interior of the casing into the discharge passage, said tube extending through said opening in the lower end of the shell and restricting communication between the float chamber and the discharge passage and the float chamber and water inlet chamber, substantially as described.